ORDER NO. EMID901302
A4

Service Manual

PCM Digital Ensemble

SX-PR250

(M), (MC), (XM), (EN), (EH), (EF), (EZ), (EW), (EA), (EP), (EK), (XL), (XR), (XS), (XD), (X)

AREAS

(M):	U.S.A.	(EK):	the United Kingdom
(MC):	Canada	(XL):	New Zealand
(XM):	Mexico	(XR):	Australia
(EN):	Norway, Sweden, Denmark, Finland	(XS):	Malaysia, Singapore, South Africa
(EH):	Holland	(XD):	Saudi Arabia
(EF):	France, Italy, Belgium	(X):	the Middle East, Indonesia, Hong Kong, the Philippines, Thailand, Taiwan
(EZ):	Germany		
(EW):	Switzerland		
(EA):	Austria		
(EP):	Spain		

Specifications

KEYBOARD		88 KEYS
SOUND GENERATOR		PCM
MAXIMUM NUMBER OF NOTES PRODUCED SIMULTANEOUSLY		32 NOTES (A MAXIMUM OF 16 SIMULTANEOUSLY PRESSED KEYS CAN BE INPUT.)
SOUND SELECT	PIANO	GRAND PIANO, UPRIGHT PIANO, E PIANO 1, E PIANO 2
		E GRAND, HARPSICHORD, MALLET, GUITAR, ELECTRIC GUITAR, SYNTH, BRASS, SYNTH BRASS, TRUMPET, SAX, REED, FLUTE, ORGAN, STRINGS, SPECIAL, ACOUSTIC BASS, ELECTRIC BASS, CHOPPER BASS (WITH VARIATION FOR EACH SOUND)
KEY SPLIT		○ (G2, C3, C4)
PEDAL		SUSTAIN, SOSTENUTO, SOFT
DIGITAL CELESTE		○ (1, 2)
DIGITAL REVERB		○ (ROOM, STAGE, HALL)
TRANSPOSE		○ (G~C~F♯)
RHYTHM	RHYTHM SELECT	MARCH, COUNTRY, WALTZ, SWING 1, SWING 2, DIXIE, JAZZ WALTZ, LATIN1, LATIN2, BOSSA NOVA, 8 BEAT, ROCK'N'ROLL, SHUFFLE, ROCK BALLAD, 16 BEAT 1, 16 BEAT 2, JAZZ ROCK, SWING ROCK, DISCO, LATIN ROCK (WITH VARIATION FOR EACH RHYTHM)
	CONTROL	START/STOP, SYNCHRO START, COUNT & FILL IN, INTRO & ENDING, TEMPO
	KEYBOARD PERCUSSION	34 KEYS
METRONOME		○ (1, 2)
ONE TOUCH PLAY		○
AUTO PLAY CHORD		BASIC SPLIT, ADVANCED SPLIT, PIANIST, PIANIST ACCOMP, ACCOMP PART 1, 2, 3
PANEL MEMORY		SET, 1~6
SEQUENCER		STORAGE CAPACITY: APPROX 7400 NOTES
		8 PARTS (RIGHT, LEFT, BASS, ACCOMP/CHORD 1, ACCOMP 2, 3, DRUMS, CONTROL) INPUT MODES: REAL TIME, STEP (ACCOMP 1/CHORD ONLY) EDIT FUNCTIONS: TRACK CLEAR, SONG CLEAR
COMPOSER		STORAGE CAPACITY: APPROX 1300 NOTES 5 PARTS (BASS, ACCOMP 1, 2, 3, DRUMS) MEMORY: 1~8 EDIT FUNCTIONS: COMPOSER CLEAR, BEAT, QUANTIZE, PERC ERASE (DRUMS ONLY)
DISPLAY		○
DEMO		○
CONTROL		MAIN VOLUME, BALANCE, TRANSPOSE/PROGRAM
TUNING		○ (± 50 CENTS)

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

Matsushita Services Company
Division of Matsushita Electric Corporation of America
50 Meadowland Parkway,
Secaucus, New Jersey 07094

Panasonic Sales Company,
Division of Matsushita Electric of Puerto Rico, Inc.
San Gabriel Industrial Park
65th Infantry Ave. Km. 9.5
Carolina, P.R. 00630

MIDI	CHANNEL, OCTAVE SHIFT, LOCAL CONTROL, P. MEM P-CHANGE, START/STOP, MIDI CLOCK, SONG SELECT, MIDI LOAD, INPUT MODE, P-CHANGE MODE, NOTE ONLY, MIDI OUT, EXT SEQ MODE
OTHERS	OCTAVE SHIFT, REVERB DEPTH, ACCOMP VOLUME, PIANO TUNING, TOUCH SENSITIVITY, PEDAL SETTING, P. MEM EXPAND, MIN RANGE, MEDLEY, DISK FORMAT, INITIAL
EXTERNAL MEMORY	DIGITAL DISK RECORDER (OPTIONAL)
TERMINALS	HEADPHONE TERMINALS × 2, LINE OUT, AUX IN, MIDI (IN, THRU, OUT)
OUTPUT	50 W × 2
SPEAKERS	16 cm × 2, 6.5 cm × 2, MONITOR SPEAKER × 2
POWER REQUIREMENT	275 W 290 VA (CANADA), 195 W (U.S.A. AND MEXICO)
	AC120/220/240 V 50/60 Hz, AC120 V 60 Hz (NORTH AMERICA AND MEXICO) AC220 V 50/60 Hz (NEDERLANDS)
DIMENSIONS (WXHXD)	143.3 cm × 83.4 cm × 59.2 cm (56-13/32" × 32-27/32" × 23-5/16")
NET WEIGHT	74 kg (163.1 lbs.)
ACCESSORIES	STAND, AC CORD

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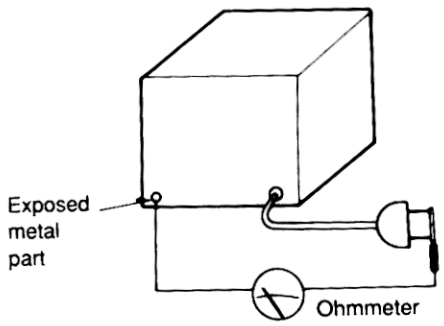
SAFETY PRECAUTION (This "safety precaution" is for the U.S.A. only)

• Safety Precaution

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

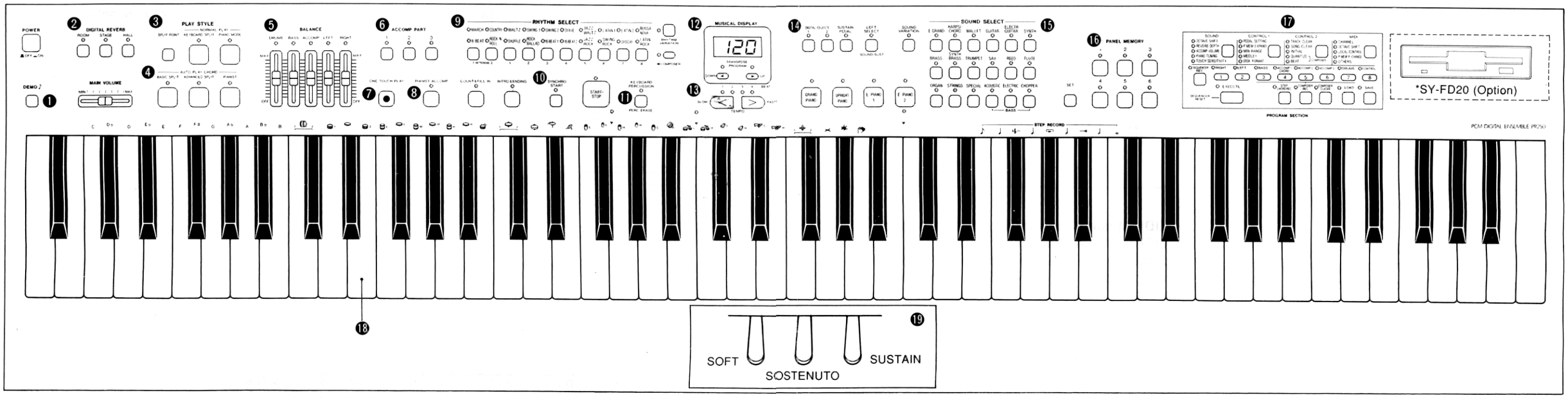
• Insulation Resistance Test

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screw heads, connectors, control shafts, handle brackets, etc. Measurements should range from 4 MΩ to infinity for all exposed parts.



Resistance=4 MΩ to ∞

ARRANGEMENT OF CONTROL PANEL



BASIC FUNCTIONS

❶ DEMO ♪
Pre-recorded performances are used to demonstrate the individual appeal of each basic rhythm and sound.

❷ DIGITAL REVERB
Select from three reverberation effects—**ROOM**, **STAGE** and **HALL**—to apply to the sound.

❸ PLAY STYLE
When playing as a piano, select either a conventional keyboard or a split keyboard. The location of the split point can be set at G2, C3 or G3 with the **SPLIT POINT** button.

❹ AUTO PLAY CHORD
When you play a chord on the keyboard, an accompaniment pattern which matches the selected rhythm is automatically produced. Select from three modes, according to your level of expertise.

❺ BALANCE
The volumes for the **DRUMS**, **BASS**, **ACCOMP**, **LEFT** and **RIGHT** parts are adjusted with their respective **BALANCE** controls.

❻ ACCOMP PART
The **AUTO PLAY CHORD** automatic accompaniment is comprised of three **ACCOMP** parts—**1**, **2** and **3**—which you can turn on and off individually.

❼ ONE TOUCH PLAY
With this special feature, you select a rhythm, and appropriate sounds and effects are automatically set in seconds.

❽ PIANIST ACCOMP
This is a totally new feature which automatically regulates the sound and rhythms of the **AUTO PLAY CHORD** accompaniment so that your piano performance stands out.

❾ RHYTHM SELECT
Various automatic rhythm patterns are stored in the permanent memory, for each of which a **RHYTHM VARIATION** is available. Two **METRONOME** types are also available.

❿ Rhythm control
The **COUNT & FILL IN** button is used to begin with a one-measure count or to insert a fill-in pattern during the rhythm performance. Use the **INTRO & ENDING** button to start a song with an intro pattern or finish with an ending pattern. **START/STOP** is used to start and stop the rhythm instantly. Or turn on the **SYNCHRO START** button to start the rhythm by pressing a key on the left side of the keyboard. Regulate the speed of the automatic rhythm with the **TEMPO** buttons. **BEAT** indicators light to show the beat.

⓫ KEYBOARD PERCUSSION
One press of the **KEYBOARD PERCUSSION** button transforms your keyboard into a whole band of percussive instruments and special sounds. The keys are picture-coded for quick and easy selection.

⓬ MUSICAL DISPLAY
During the normal performance mode, the tempo is displayed. During other modes, the **MUSICAL DISPLAY** is a multi-function indicator, used when setting the transposed key, to show the remaining memory in the **SEQUENCER** or **COMPOSER**, when setting the time signature or **QUANTIZE** level for the **COMPOSER**, when adjusting or selecting various programmable functions, and to show various messages when using the Digital Disk Recorder.

⓭ TRANSPOSE
C is the standard setting, but you can raise or lower the key of the entire keyboard in semi-tone steps across an entire octave.

⓮ EFFECTS
DIGITAL CELESTE gives the sound a thickness and diffusion; **SUSTAIN PEDAL** controls the enable/disable status of the sustain pedal.

⓯ SOUND SELECT
Select from four piano-type sounds when playing as a standard piano, or choose one of the many non-piano sounds. A **SOUND VARIATION** is available for each non-piano sound.

⓰ PANEL MEMORY
Set the desired sounds, effects, split point, volume settings, rhythm, tempo, etc. with the panel controls. Then store the panel settings in one of the programmable memories. Then while you play, the touch of one button recalls the panel settings instantly.

⓱ PROGRAM SECTION
Open the sliding cover to use the multi-purpose **PROGRAM SECTION**. These buttons are used when setting the functions for the **SEQUENCER**, **COMPOSER** or MIDI, when using some of the Digital Disk Recorder functions, and when custom-setting any of the numerous programmable functions.

⓲ Keyboard
This keyboard features Touch Response, by which you control the volume by playing the keys harder or softer.

⓳ Pedals
The sustain pedal and sostenuto pedal apply sustain effects, and the soft pedal works as a damper.

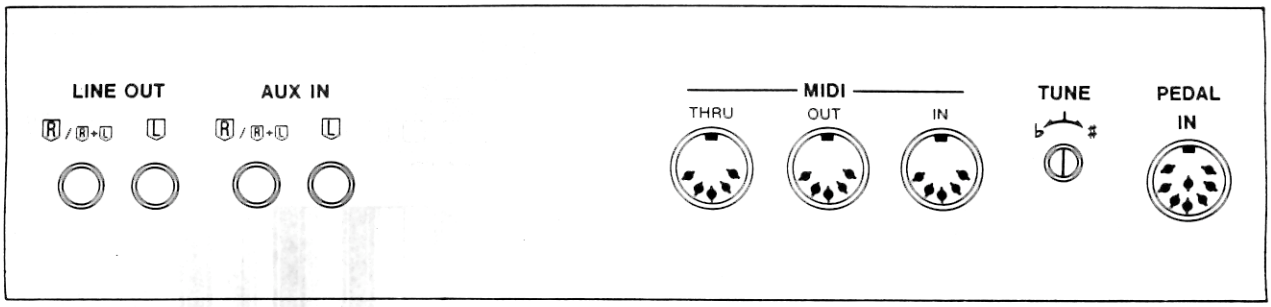
⓴ Digital Disk Recorder SY-FD20 (option)
The Digital Disk Recorder allows you to store up to 20 performances on a memory disk.

Initialization

The following procedure resets all programmable settings, functions and memories to their initialized (factory-preset) status. Use this procedure if the buttons, keys, etc. malfunction, or when you wish to reset the memories ands functions.

<Procedure>
1. Turn off the **POWER** button.
2. While pressing the three leftmost buttons in the **RHYTHM SELECT** section (**METRONOME 1**, **METRONOME 2** and **1**) at the same time, turn the **POWER** button on again.

CONNECTION TERMINALS



TUNE
During an ensemble performance with other instruments, fine adjustments of pitch can be made using this knob. The center position is standard pitch (A=440 Hz). The pitch is adjustable in a range of ±50 cents.

PEDAL IN
Connect the cord from the included stand to this terminal.

AUX IN (input level 0.5 V, 15 kΩ)
Other instruments such as a rhythm machine or sound module can be connected to the piano so that the sound is output from the piano. To receive monaural sound, connect the other instrument to the **R/R+L** terminal. (Do not connect the **L** terminal.)

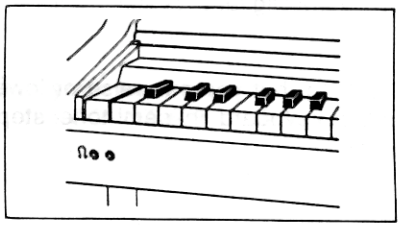
LINE OUT (output level 1.5 V 600 Ω)
By plugging into an external high-power amplifier, the sound can be reproduced at a high volume. Or connect a tape recorder and use them as recording terminals. To output monaural sound, connect the external equipment to the **R/R+L** terminal. (Do not connect the **L** terminal.)

MIDI (Musical Instrument Digital Interface)
MIDI is the standard specification that enables connection to equipment such as synthesizers and personal computers. Data transmission and reception are possible between the Technics Digital Ensemble and instruments provided with MIDI terminals.

IN: The terminal that receives data from external equipment.
OUT: The terminal that transmits data from the piano to external equipment.
THRU: The terminal that transfers data from the IN terminal directly to other equipment.

- Use a 5-pin DIN cord (less than 15m long) for these connections.

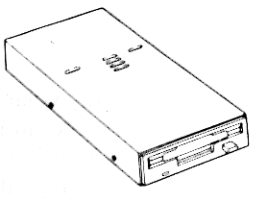
PHONES (∩) × 2
For silent practice, headphones may be used. When plugged in, the speaker system is automatically switched off, and sound is heard only through the headphones.



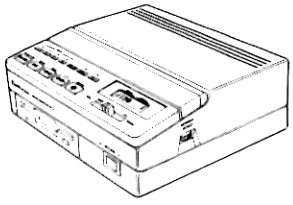
OPTIONS

SZ-CP3
Bench

SZ-CP4M
Bench



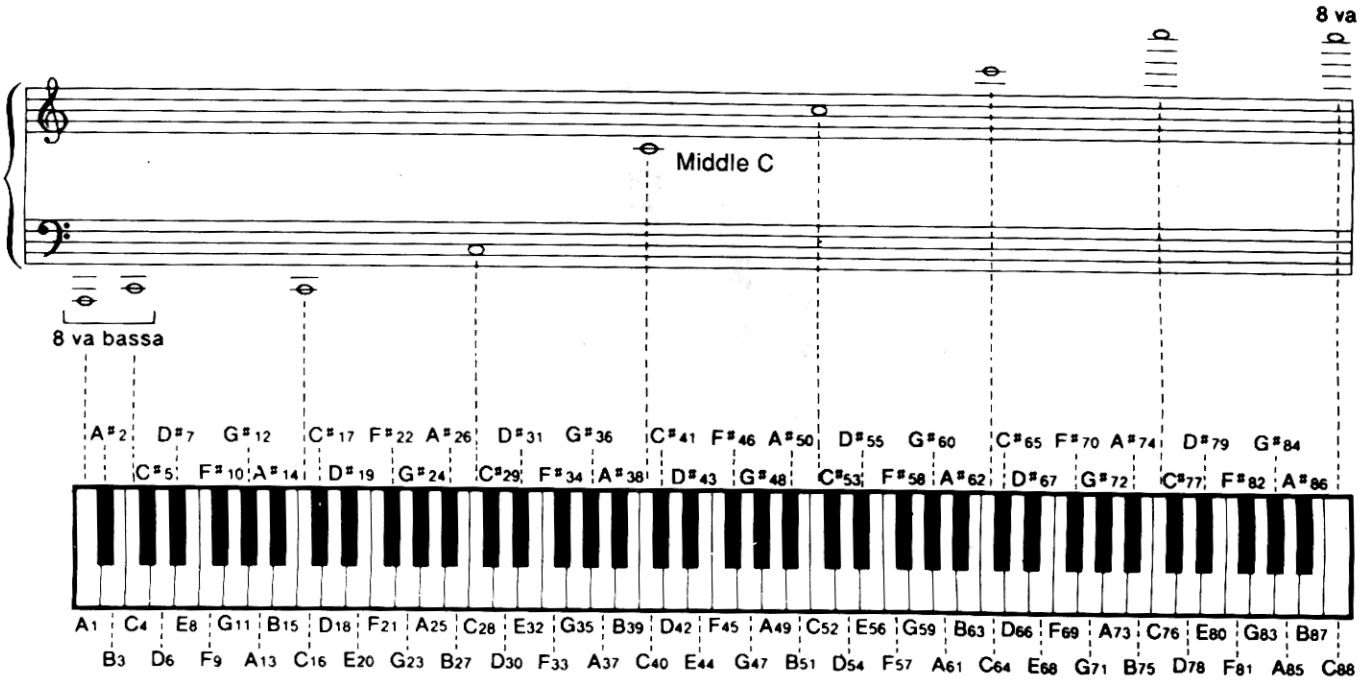
SY-FD20
Digital Disk Recorder



SY-MQ8
MIDI Sequencer

KEYBOARD RANGES

• This keyboard features Touch Response, by which you control the volume by playing the keys harder or softer.

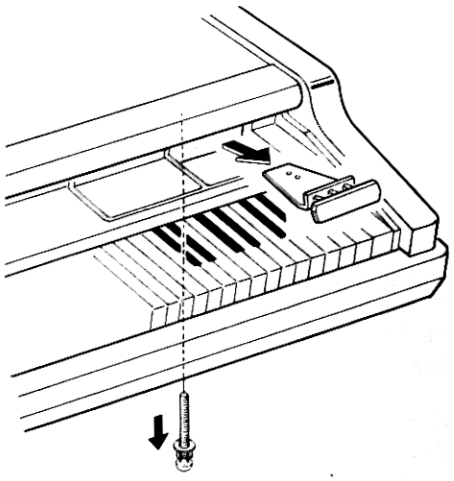


INSTALLATION OF SY-FD20 (OPTION)

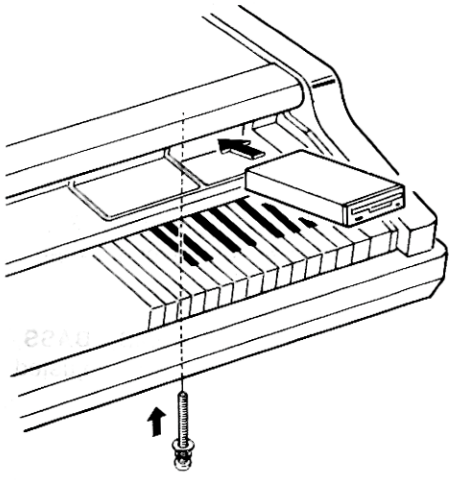
1. Make sure that the power to the Digital Ensemble is turned off.

2. Remove the screw from under the right side of the keyboard. The cover can now be removed from the Digital Disk Recorder compartment.

3. Insert the Digital Disk Recorder into the compartment opening and push it in firmly as far as it will go. Secure the Digital Disk Recorder with the screw that you removed in step 2.



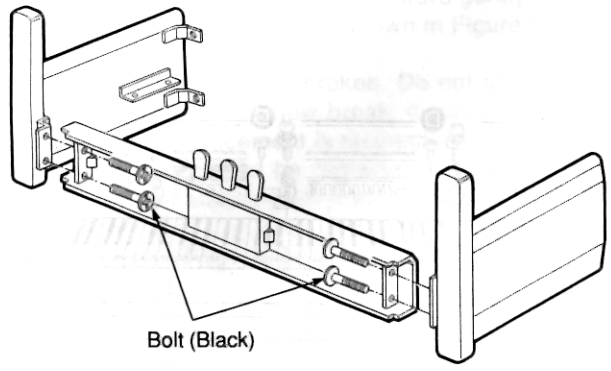
[Fig. 1]



[Fig. 2]

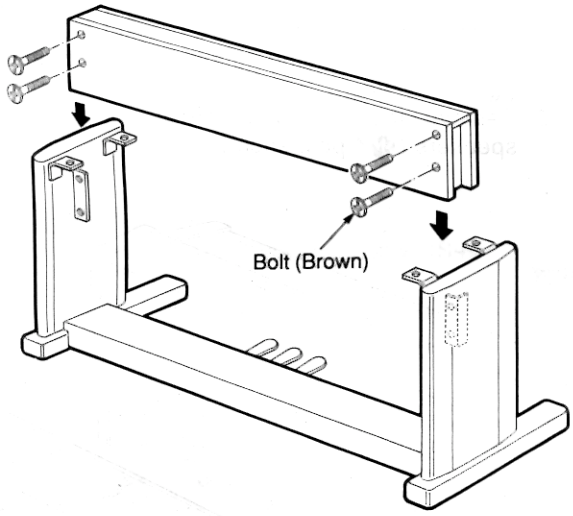
HOW TO ASSEMBLE THE PIANO

1 Assemble the side panels and the pedal box using the 4 black bolts.



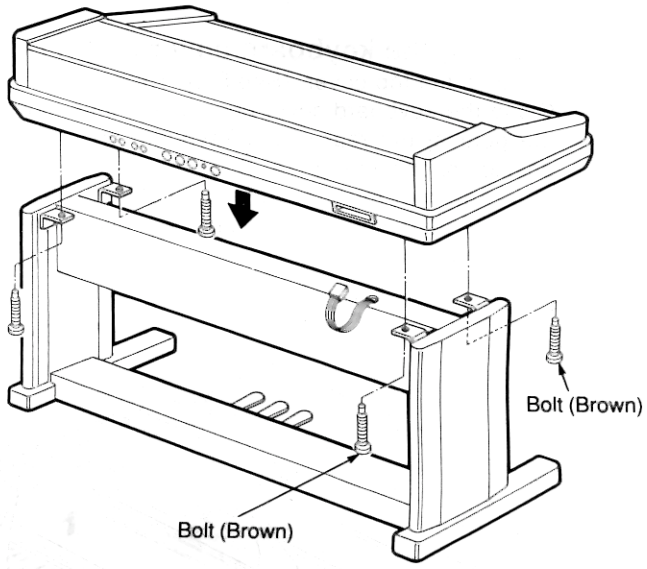
[Fig. 3]

2 Place the stand upright and mount the speaker box onto the L-shaped brackets with 4 brown bolts.



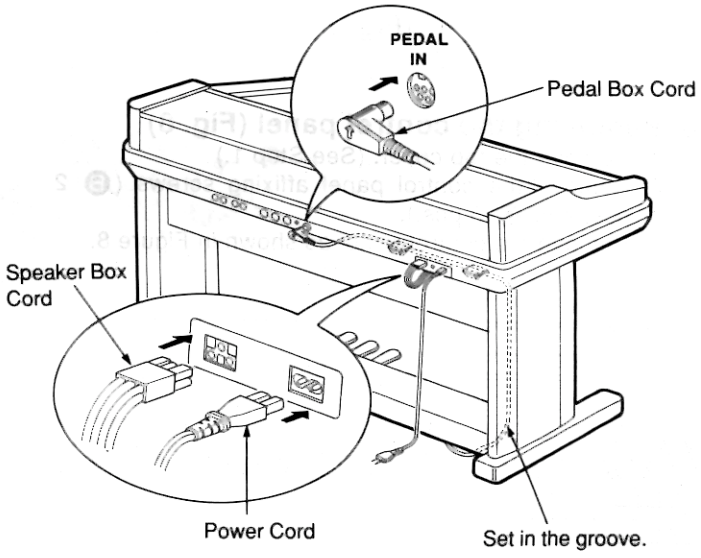
[Fig. 4]

3 Place the piano unit on the stand and secure it to the stand with 4 brown bolts.



[Fig. 5]

4 Connect the pedal box cord and speaker box cord to their respective sockets located on the rear of the piano unit as shown below.



[Fig. 6]

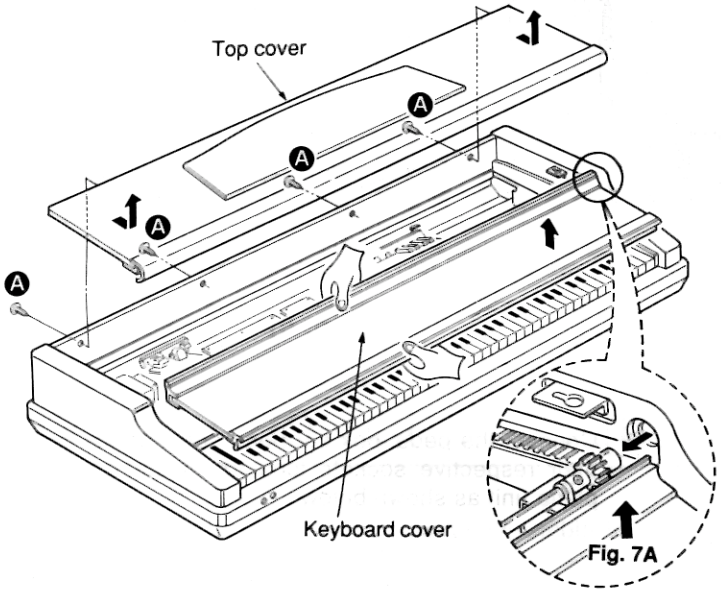
DISASSEMBLY INSTRUCTIONS

1 Removing the top cover (Fig. 7)

1. Remove the top cover affixing screws (Ⓐ 4 pcs.).
2. Slide the top cover forward and lift up (as shown by the arrows).

2 Removing the keyboard cover (Fig. 7)

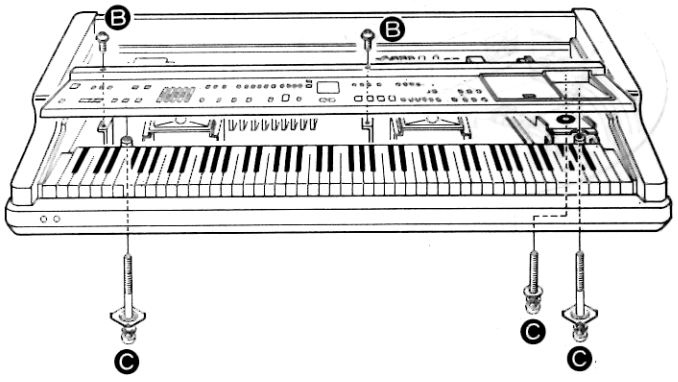
1. Remove the top cover. (See Step 1.)
2. Close the keyboard cover completely, thus moving the gear at the rear of the keyboard cover to the position shown in Fig. 7A. Slide the gear to the left to free it from the groove in the cabinet. Remove the keyboard cover by raising the end with the freed gear.



[Fig. 7]

3 Removing the control panel (Fig. 8)

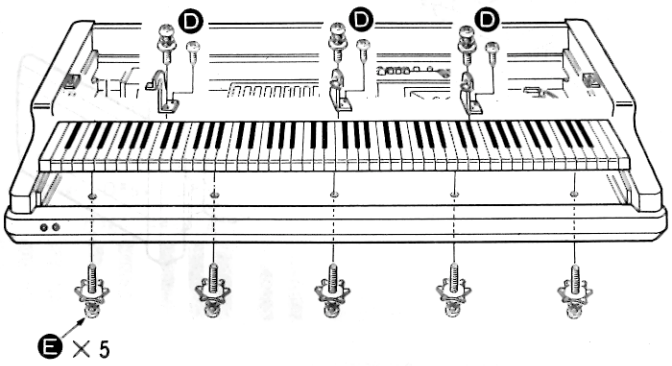
1. Remove the top cover. (See Step 1.)
2. Remove the control panel affixing screws (Ⓑ 2 pcs. and Ⓒ 3 pcs.).
3. Remove the control panel as shown in Figure 8.



[Fig.8]

4 Removing the keyboard assembly (Fig. 9)

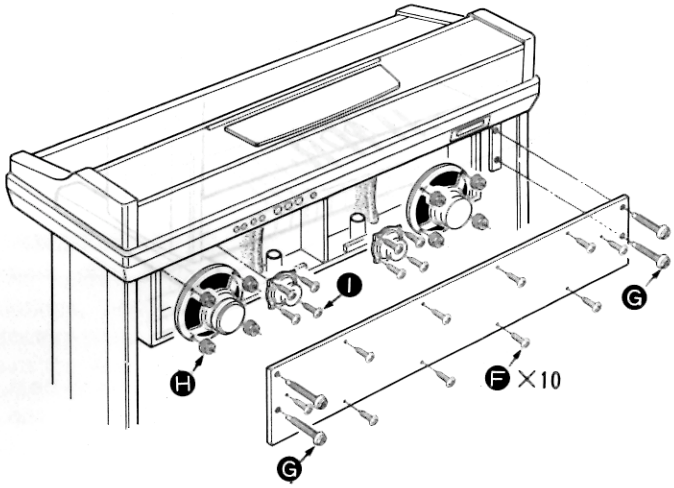
1. Remove the top cover. (See Step 1.)
2. Remove the metal fittings affixing screws (Ⓓ 6 pcs.).
3. Remove the keyboard assembly affixing screws located on the bottom of the cabinet (Ⓔ 5 pcs.).



[Fig. 9]

5 Removing the speakers (Fig. 10)

1. Remove the mounting screws for the rear board of the speaker box (Ⓕ 10 pcs. and Ⓖ 4 pcs.).
   - Be careful that the speaker box does not fall off, since it comes free of the L-bracket of the stand.
2. Remove the mounting nuts for the 16 cm speakers (Ⓗ 4 pcs. each).
3. Remove the mounting screws for the 6.5 cm speakers (Ⓘ 4 pcs. each).



[Fig. 10]

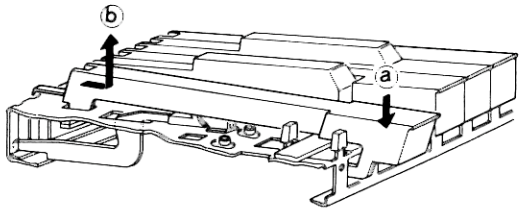
6 Key(s)

Disassembly (Fig. 11):

1. Remove the keyboard from the cabinet. (See Step 4.)
2. To release the key claw.
   ⓐ Press the front of the key downward slightly.
   ⓑ Press the rear of the key forward gently.
3. To remove the key, lift as shown in Figure 11.

NOTE:

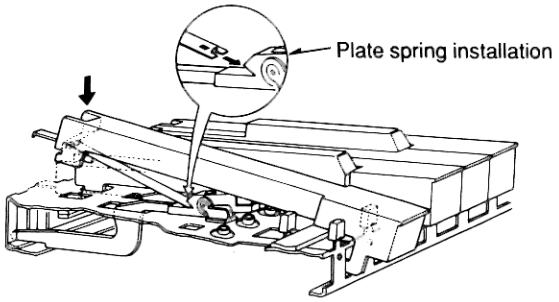
- The key claw is easily broken. Do not apply undue force. Should a key claw break, it can still be used; however, a replacement is recommended.
- If a black key is to be replaced it is necessary to remove both adjacent white keys.



[Fig. 11]

Assembly (Fig. 12):

1. Insert the front part of the key into the chassis.
2. Insert the plate spring into the hammer notch as shown in Figure 12.
3. While slowly lowering the key into the chassis, insert the plate spring into the notch at the rear of the key.
4. Carefully insert the key into the opening in the chassis and slide the key towards the rear to lock it in place.



[Fig. 12]

7 Removing the printed circuit boards

MAIN P.C.B.

1. Remove the top cover. (See step 1.)
2. Remove the MAIN P.C.B. mounting screws on the rear panel (❾ 3 pcs.).
3. Release the 2 claws of the P.C.B. holder to remove the MAIN P.C.B.

ACP P.C.B.

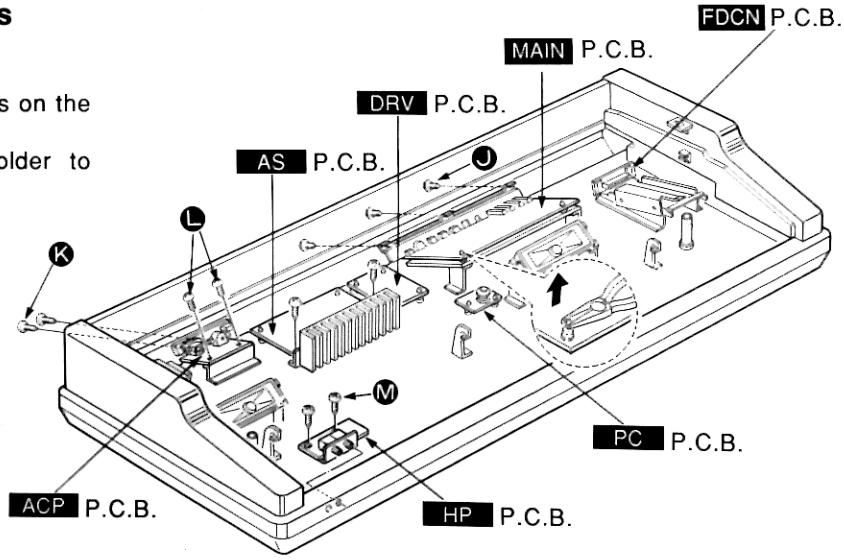
1. Remove the top cover. (See step 1.)
2. Remove the ACP P.C.B. mounting screws on the rear panel (❽ 2 pcs.).
3. Remove the ACP P.C.B. mounting screws (❿ 2 pcs.).

HP P.C.B.

1. Remove the keyboard assembly. (See step 4.)
2. Remove the HP P.C.B. mounting screws (Ⓜ 2 pcs.).

Others P.C.B.

- If removing a P.C.B. other than those mentioned above, release the claws of the P.C.B. holder and remove the screws on each P.C.B.



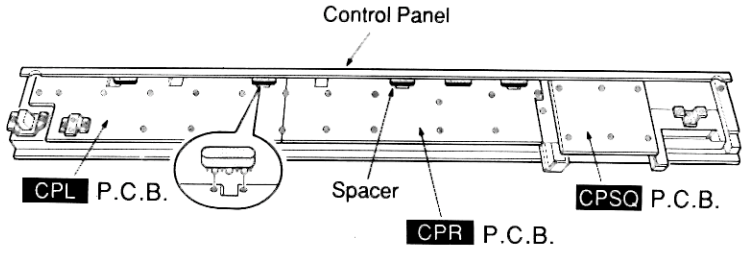
[Fig. 13]

CPL CPR CPSQ P.C.B.

1. Remove the control panel. (See step 3.)
2. Remove the control panel P.C.B. mounting screws and spacers.

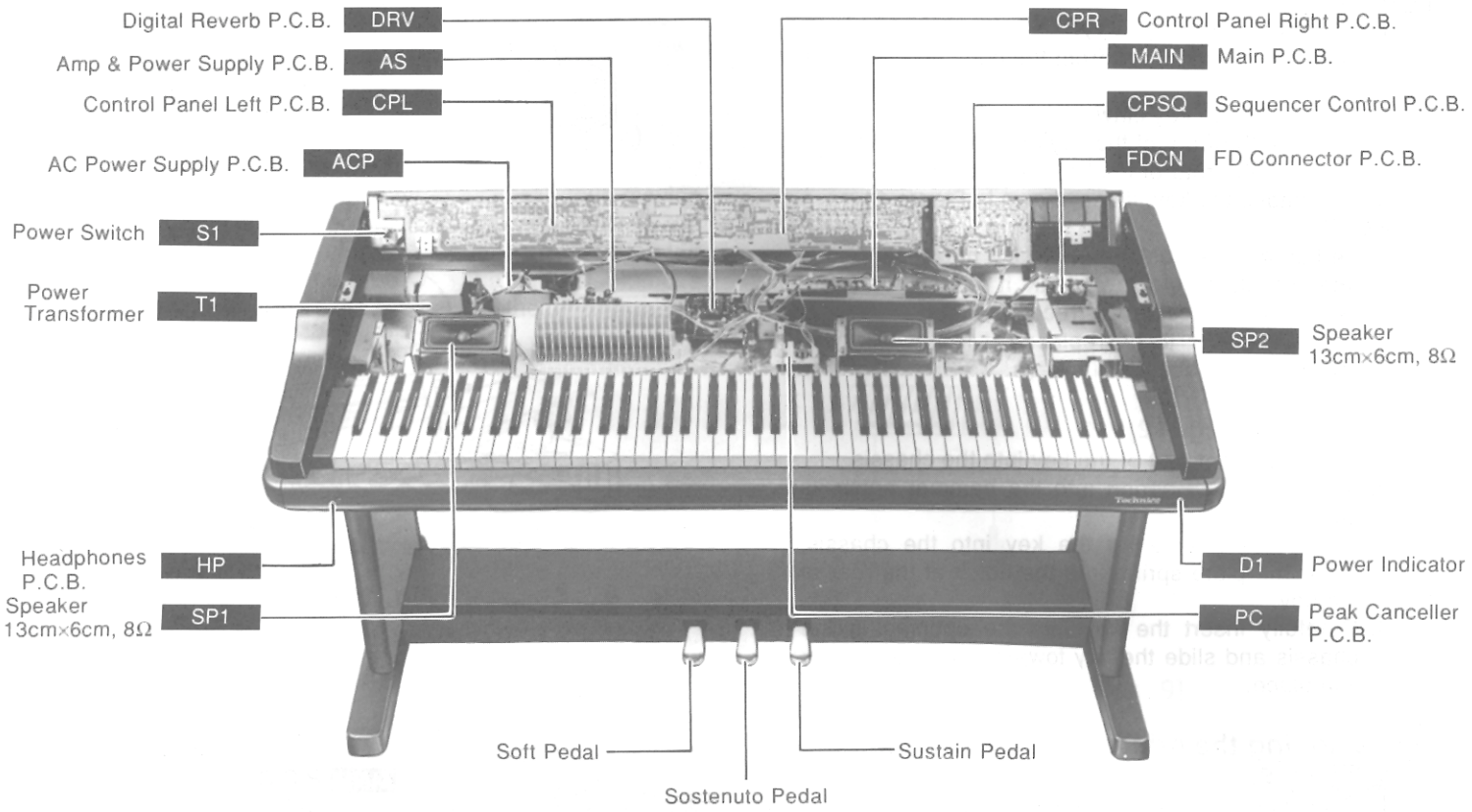
NOTE:

- When installing the CPL and CPR P.C.B.'s, be sure to affix the spacers, as shown in Figure 14.

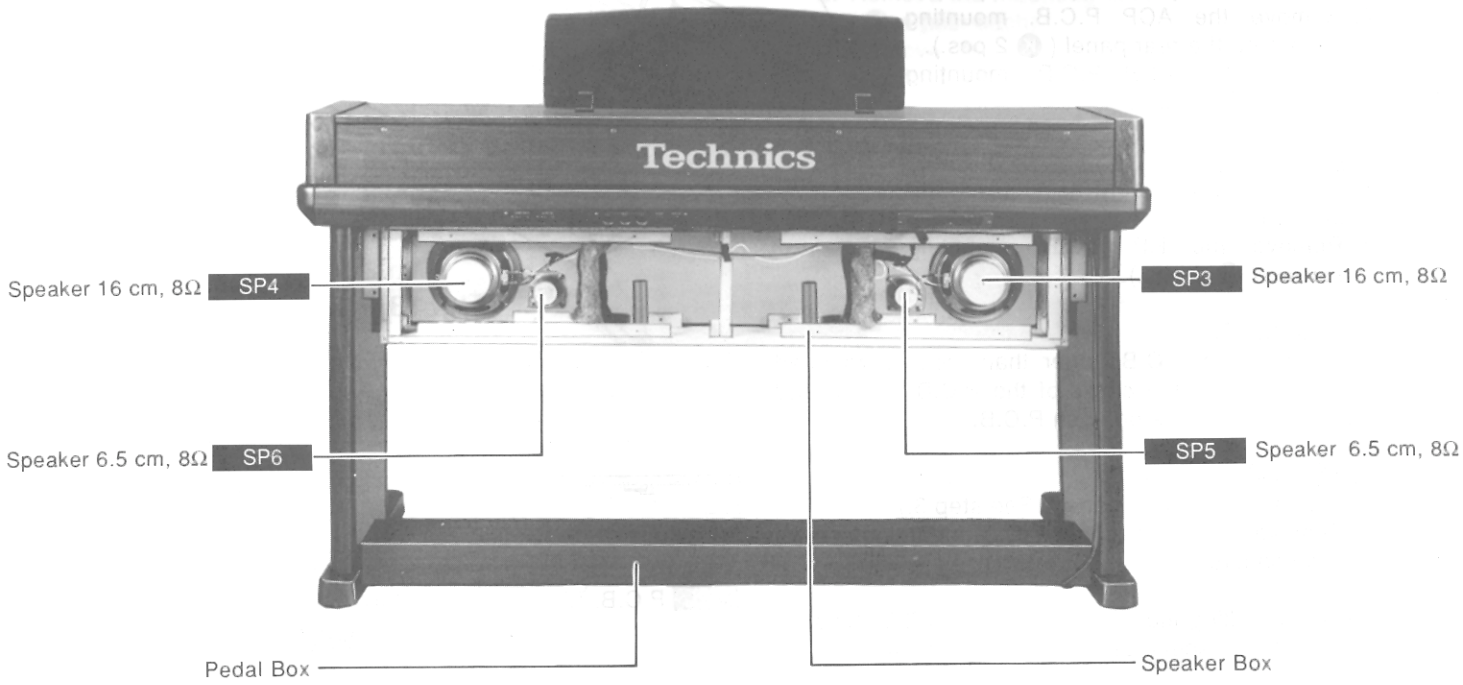


[Fig. 14]

PARTS LOCATION

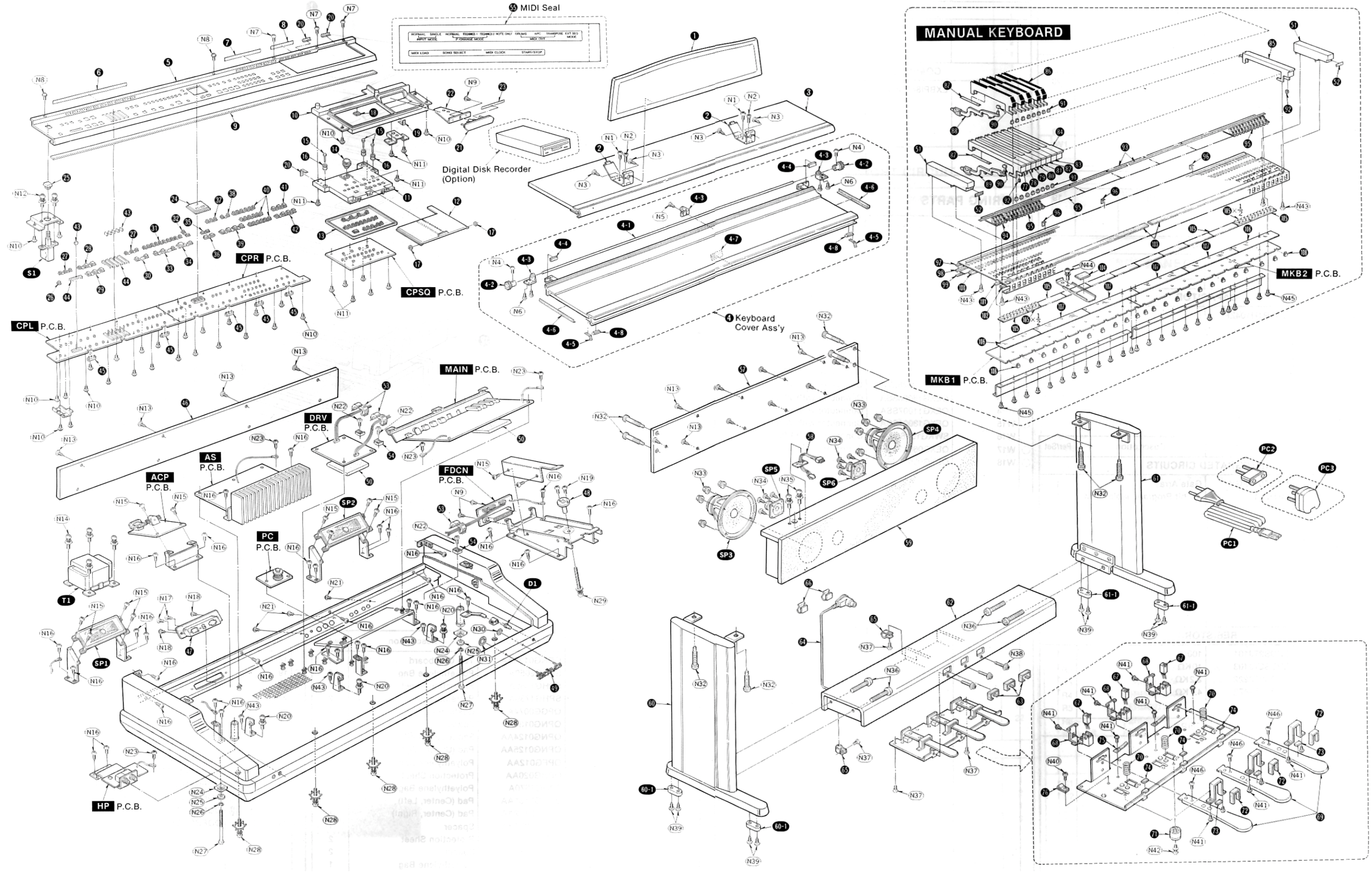


[Photo-1]



[Photo-2]

EXPLODED VIEWS OF CABINET



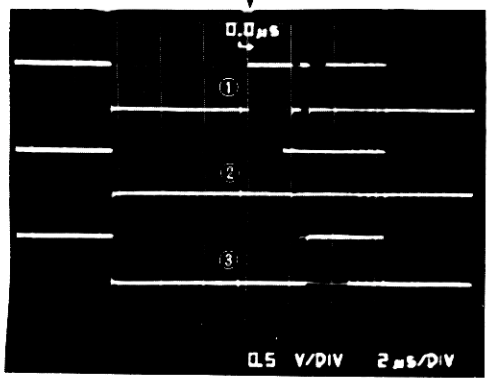
MEASUREMENTS AND ADJUSTMENTS

■ Measuring Equipment

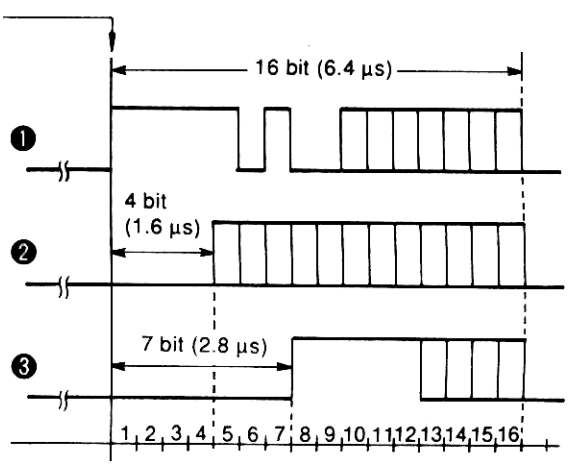
• Oscilloscope 20 MHz, 10:1 probe/1:1 probe

ADJUSTMENT	MEASURING CONDITIONS	EQUIPMENT	ADJUSTMENT P.C.B.	ADJ. POINT	CONNECT POINT(S)	READING
DRV bias	any position	Oscilloscope	DRV P.C.B.	VR1	Checkpoint ⑫ ⑬	Photo-A Fig. A

1. Connect the oscilloscope channel 1 to DRV P.C.B. checkpoint ⑫ and connect the oscilloscope external trigger to DRV P.C.B. checkpoint ⑬. (Set the oscilloscope CH1 triggering with EXT in.)
2. Turn VR1 on the DRV P.C.B. fully clockwise and set the data starting point to the oscilloscope division scale to facilitate adjustment in next procedure. (See photo A-❶.)
3. Confirm that the first 4 bits (or 5 bits) are low when VR1 is turned fully counter-clockwise. (See photo A-❷, Fig. A-❷.)
4. Gradually turn VR1 clockwise and make the first 7 bits (2.8µs) turn to low. (See photo A-❸, Fig. A-❸.)



[Photo-A]



[Fig. A]

D/A Converter offset	any position	Oscilloscope	MAIN P.C.B.	VR2	IC21-① pin	0V ±5 mV

1. Set the oscilloscope voltage division to 5 mV/cm (Use the 1:1 oscilloscope probe) and connect the oscilloscope probe to MAIN P.C.B. IC21 Pin ①.
2. Turn VR2 to adjust the voltage to zero.

MEMO

SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE

The following changes in performance may occur in the Digital Ensemble but do not indicate trouble.

	Phenomenon	Remedy
Sounds and effects	The buttons, keys, etc. malfunction.	• Turn off the **POWER** button once, then turn it on again. If this procedure is not successful, turn off the **POWER** button once. Then, while pressing the three leftmost buttons in the **RHYTHM SELECT** section (**METRONOME 1**, **METRONOME 2** and **1**) at the same time, turn the **POWER** button on again. (Note that, in this case, all programmable settings, functions and memories return to their factory-preset status.)
	No sound is produced when the keys are pressed.	• The **MAIN VOLUME** is at the minimum setting. Adjust the volume with the **MAIN VOLUME** control. • The **DEMO** ♪ button is on, and " _ _ _ " is shown on the display. Press the **DEMO** ♪ button to turn it off. The display returns to the tempo display. • The **BALANCE** volumes are set to **OFF**. Use the sliding **BALANCE** controls to set the volumes of the relevant parts to appropriate levels. • The local control for a part performed on the keyboard is set to off. Set the local control to on.
	The octave is higher or lower for some **SOUND SELECT** sounds.	• An octave change is programmed for some instrument sounds in order to make them easy to play. This is not a malfunction.
	Only percussive instrument sounds are produced when the keyboard is played.	• The **KEYBOARD PERCUSSION** button is on. Turn it off to return the keyboard to the normal sound.
	The sustain does not work even when the sustain pedal is depressed.	• When the **SUSTAIN PEDAL** button is off, the sustain does not work even when the pedal is depressed. Turn on the **SUSTAIN PEDAL** button.
	The sostenuto pedal (PR250/PR350) and soft pedal do not operate properly. For example, when the soft pedal is depressed, the rhythm starts or a fill-in is played.	• Different functions can be programmed in these pedals. You can return the pedals to their original functions by turning off the instrument once, or by using the **PEDAL SETTING** mode.
Rhythm	The rhythm does not start.	• The **DRUMS** volume in the **BALANCE** section is set to **OFF**. Use the sliding **BALANCE** control to set the **DRUMS** volume to an appropriate level. • In the **RHYTHM SELECT** section, a **COMPOSER** number button with no stored performance was selected. Change the rhythm or store a new rhythm pattern in the **COMPOSER**. • When a **SEQUENCER** part button (in the **PROGRAM SECTION**) is on, the rhythm will not start unless the rhythm has been stored. Turn off the **SEQUENCER** part buttons. • The MIDI clock is set to the external clock. Set the MIDI clock to the internal clock.
	The only rhythm produced is a hi-hat and bass drum sound.	• This is the rhythm sound produced when the **KEYBOARD PERCUSSION** button is on. When the **KEYBOARD PERCUSSION** button is turned off, the rhythm returns to normal.
AUTO PLAY CHORD	No sound is produced for the automatic accompaniment, or only the sounds of some parts are produced.	• The **BALANCE** volumes are set to **OFF**. Use the sliding **BALANCE** controls to set the volumes of the relevant parts to appropriate levels. • An **ACCOMP** part does not sound if its corresponding **ACCOMP PART 1**, **2** or **3** button is off. Press the desired **ACCOMP PART 1**, **2** and **3** buttons to turn them on. • An **ACCOMP** part does not sound if its volume is set to 0. The volume of each **ACCOMP** part can be adjusted independently.

	Phenomenon	Remedy
SEQUENCER	Storage is not possible.	• The remaining storage capacity of the **SEQUENCER** memory is 0. Use the **TRACK CLEAR** or **SONG CLEAR** function to erase the memory. • The MIDI **EXT SEQ MODE** is set to on. Set it to off.
	Multi-track storage is not possible.	• The playback track has been selected, but the **START/STOP** button has not been pressed. A flashing track indicator shows the track which is ready for recording, and a lit track indicator shows a track which is ready for playback. To record one track while listening to another (playback) track, press the **START/STOP** button to begin playback.
	A previously stored song is played back.	• The tracks of a song which was previously stored have not been cleared. Use the **TRACK CLEAR** or **SONG CLEAR** function to erase the memory before recording a new song.
COMPOSER	Storage is not possible.	• The remaining storage capacity of the **COMPOSER** memory is 0. Erase a **COMPOSER** number button in the **RHYTHM SELECT** section in which a pattern is stored.
	The playback timing of the rhythm pattern is different from the timing with which it was stored.	• The **QUANTIZE** function was on when the pattern was recorded. (The default setting is " 1 6 ".) Set the **QUANTIZE** function to " O F F ".
	Setting the time signature is not possible.	• The time signature cannot be changed for a pattern which is currently stored in the **COMPOSER**. When storing in the **COMPOSER** and " A L L " appears on the display, press the **COMPOSER CLEAR** button to erase the previously stored rhythm pattern.
	When editing a preset rhythm, the drums sound is not erased even when the **PERC ERASE** button is pressed.	• Some of the drums sounds of preset rhythm patterns cannot be erased. Follow the **COMPOSER CLEAR** procedure.
Digital Disk Recorder (optional)	The Digital Disk Recorder produces a noise during recording or playback.	• This occurs when the Digital Disk Recorder is reading a disk. It does not indicate a problem.
	When the operation to load from a memory disk is performed, the contents of the **SEQUENCER** are erased.	• When performing the load operation from a memory disk, the **SEQUENCER** memory changes to that of the data loaded from the memory disk. If you wish to preserve a song which is stored in the **SEQUENCER** memory, save it in a memory disk before performing the load procedure.

ERROR DISPLAY

When using the Digital Disk Recorder (sold separately) any of the following error messages may appear on the display. If an error message appears, follow the appropriate steps to remedy the problem.

Display	Remedy
Er-0	The memory disk has not been formatted by the Digital Disk Recorder. • Insert a correctly formatted disk.
Er-1	Loading failure. • Perform the loading procedure again.
Er-2	No memory disk in the Digital Disk Recorder. • Insert a memory disk.
Er-3	You have attempted to load a song number which has not been saved. • Load a song number which has been saved.
Er-4	No Digital Disk Recorder. • Install the SY-FD20.
Er-5	Saving failure. • Perform the saving procedure again.
Er-6	The memory disk is write-protected. • Close the write-protect window of the disk.
Er-7	No remaining memory storage capacity. • Insert a new disk, perform the saving procedure after formatting it.
Er-8	Formatting failure. • Perform the formatting procedure again.
Er-9	You have attempted to save a song which is copy-protected. • A copy-protected song cannot be saved.
E 13	The **SEQUENCER** does not function because the **EXT SEQ MODE** is on. • Set the **EXT SEQ MODE** to off.

Warning:

- Some pre-recorded disks (for example, those recorded by the manufacturer) are copy-protected. Data from these disks cannot be copied.
- When the power is turned off after a copy-protected song has been loaded, the **SEQUENCER** contents will be erased.
- If a copy-protected song has been loaded and you want to then record a new song in the **SEQUENCER** and save it on a disk, be sure to first turn the power off once or perform the initialization procedure.

MIDI IMPLEMENTATION CHART

Digital Ensemble
[SX-PR50V/SX-PR150/SX-PR250/SX-PR350] **(Transmitted)**

Function		RIGHT	LEFT	ACCOMP 1	ACCOMP 2	ACCOMP 3	BASS	DRUMS	CONTROL	Remarks
Basic Channel	Default	1~16	1~16	1~16	1~16	1~16	1~16	1~16	1~16	memorized
	Changed	1~16	1~16	1~16	1~16	1~16	1~16	1~16	1~16	
Mode	Default	3	3	3	3	3	3	3	3	OMNI OFF POLY MODE
	Messages	×	×	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	—	—	
Note Number		31~102	31~102	31~102	31~102	31~102	31~102	36~69**	—	Changes depending on the position of the transpose control.
	True voice	—	—	—	—	—	—	—	—	
Velocity	Note ON	○	○	○	○	○	○	○	—	
	Note OFF	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	—	
After Touch	Key's	×	×	×	×	×	×	×	×	
	Ch's	×	×	×	×	×	×	×	×	
Pitch Bender		×	×	×	×	×	×	×	×	
Control Change	7	○	○	○	○	○	○	○	○	volume (MAIN VOLUME)
	64	○	○	○	○	○	○	×	×	sustain
	66	○	○	×	×	×	×	×	×	sostenuto pedal
	67	○	○	○	○	○	○	×	×	soft pedal
	80	×	○	×	×	×	×	×	×	auto play chord
	82	×	×	×	×	×	×	○	×	intro & ending, fill in
	83	○	○	×	×	×	×	×	×	octave shift
	93	○	×	×	×	×	×	×	×	chorus (DIGITAL CELESTE 1)
	94	○	×	×	×	×	×	×	×	celeste (DIGITAL CELESTE 2)
Prog Change		○	○	○	○	○	○	○	×	
	True #	—	—	—	—	—	—	—	—	
System exclusive		×								
System common	Song Pos	×								
	Song Sel	*○× (0~19)								
	Tune	×								
System Real Time	Clock	○								
	Commands	*○×								start/stop, continue
Aux Messages	Local ON/OFF	×	×	×	×	×	×	×	—	
	All notes OFF	○	○	○	○	○	○	○	—	
	Active Sense	○								
	Reset	×								
Notes	* ○ × .....Whether or not the data for each of these items is transmitted can be set. **When the program change mode is set to **TEC** (on), note numbers for **DRUMS** differ.									

Mode 1: OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes
Mode 3: OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No

Digital Ensemble

[SX-PR50V/SX-PR150/SX-PR250/SX-PR350] **(Recognized)**

Function		RIGHT	LEFT	ACCOMP 1	ACCOMP 2	ACCOMP 3	BASS	DRUMS	CONTROL	Remarks
Basic Channel	Default	1~16	1~16	1~16	1~16	1~16	1~16	1~16	1~16	memorized
	Changed	1~16	1~16	1~16	1~16	1~16	1~16	1~16	1~16	
Mode	Default	3	3	3	3	3	3	3	3	OMNI OFF POLY MODE
	Messages	×	×	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	—	—	
Note Number		0~127	0~127	0~127	0~127	0~127	0~127	36~69**	—	Changes depending on the sound.
	True voice	36~119	36~119	36~119	36~119	36~119	24~107	36~69	—	
Velocity	Note ON	○	○	○	○	○	○	○	—	
	Note OFF	×	×	×	×	×	×	×	—	
After Touch	Key's	×	×	×	×	×	×	×	×	
	Ch's	×	×	×	×	×	×	×	×	
Pitch Bender		○	○	○	○	○	○	×	×	
Control Change	7	○	○	○	○	○	○	○	○	volume (MAIN VOLUME)
	64	○	○	○	○	○	○	×	×	sustain
	66	○	○	×	×	×	×	×	×	sostenuto pedal
	67	○	○	○	○	○	○	×	×	soft pedal
	80	×	○	×	×	×	×	×	×	auto play chord
	82	×	×	×	×	×	×	○	×	intro & ending, fill in
	83	○	×	×	×	×	×	×	×	octave shift
	93	○	×	×	×	×	×	×	×	chorus (DIGITAL CELESTE 1)
	94	○	×	×	×	×	×	×	×	celeste (DIGITAL CELESTE 2)
Prog Change		0~15 (PR50V/PR150)	0~15 (PR50V/PR150)	0~15 (PR50V/PR150)	0~15 (PR50V/PR150)	0~15 (PR50V/PR150)	0~15 (PR50V/PR150)	0~29		
	True #	0~21 (PR250/PR350)	0~21 (PR250/PR350)	0~21 (PR250/PR350)	0~21 (PR250/PR350)	0~21 (PR250/PR350)	0~21 (PR250/PR350)			
System exclusive		×								
System common	Song Pos	×								
	Song Sel	*○× (0~19)								
	Tune	×								
System Real Time	Clock	○								
	Commands	* ○ ×								start/stop, continue
Aux Messages	Local ON/OFF	×	×	×	×	×	×	×	—	
	All notes OFF	○	○	○	○	○	○	○	—	
	Active Sense	○								
	Reset	×								
Notes		* ○ × .....Whether or not the data for each of these items is transmitted can be set. **When the program change mode is set to **TEC** (on), note numbers for **DRUMS** differ.								

Mode 1: OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes

Mode 3: OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No

PRECAUTIONS BEFORE SERVICING

■ Precautions for measuring of the output waveforms.

1. The waveform was measured by "National Digital Storage Oscilloscope VP-5730A". Therefore the waveforms of musical tone signals shown may differ somewhat due to variation of timing of triggering.
2. Since the 1/10 test probe is used, the indicated voltage value on the bottom part of each waveform photo is 1/10 of the actual value (e.g. 0.2V/cm should be 2.0V/cm).
3. This Digital Ensemble has a touch sensitivity type keyboard. Therefore the touch sensor level must be set to "0" level when checking waveform measurements after activating the initial setting.
   - Initial setting method
   (1) Turn off the **POWER** button.
   (2) While pressing the three leftmost buttons in the **RHYTHM SELECT** section (**METRONOME 1**, **METRONOME 2** and **1**) at the same time, turn the **POWER** button on again.
   - Touch sensitivity setting method
   (1) Select "TOUCH SENSITIVITY" in the **PROGRAM SECTION** with the **SOUND** button.
   (2) Adjust the touch sensitivity level to "0" with the **TRANSPOSE/PROGRAM** button.
   (3) Press the **SOUND** button again to set the level.

■ Important safety notice:

Components identified by a ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only the manufacturer's specified parts.

■ Symbolic marks

The symbolic marks for resistors and capacitors used in these circuits are classified following TABLE-1 and TABLE-2.

1. RESISTORS
   - Resistors without a symbolic mark are FIXED CARBON FILM RESISTORS (ERD-type).
   - All resistors are 1/4 WATT, ±5% TOLERANCE unless otherwise designated in the schematic diagrams.

(TABLE-1)

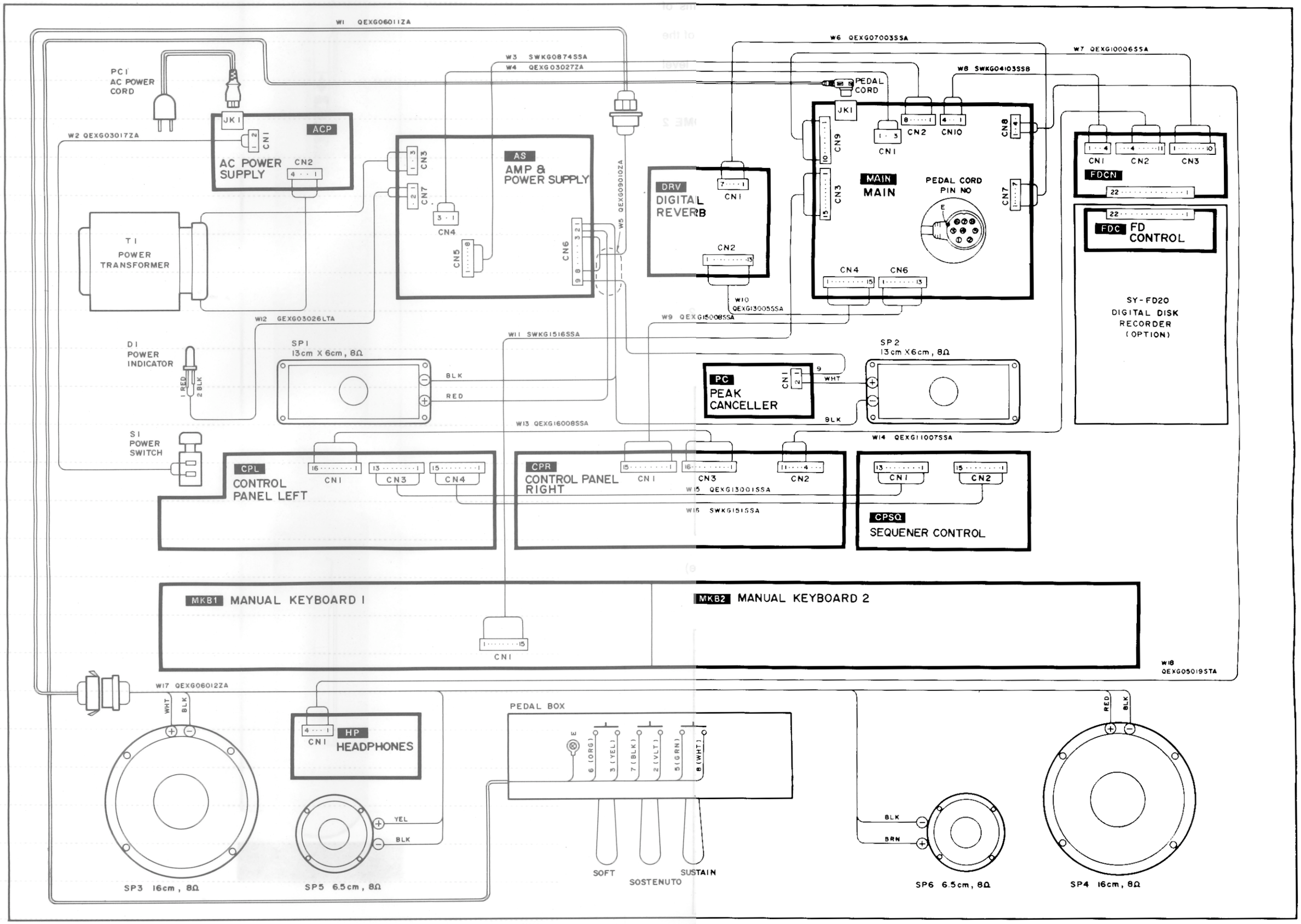
SYMBOL	SPECIFICATION	SYMBOL	SPECIFICATION
Ⓕ	Fixed Carbon Film Resistors "FLAME-PROOF" (ERD__F__type)	Ⓕ	Fixed Metal Film Resistors "FLAME-PROOF" (ERX__type)
Ⓕ	Fixed Wire Wound Resistors "FLAME-PROOF" (ERF__type)	[F]	Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERQ__type)
Ⓕ	Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERG__type)	[F]	Fuse Type Fixed Carbon Film Resistors "FLAME-PROOF" (ERD2FC__type)
Ⓖ	Fixed Metal Film Resistors (Precision and High Stability) (ERO__type)		

2. CAPACITORS
   - Capacitors without a symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type, ±10% Tolerance)
   - Polarized capacitors without a symbolic mark are Aluminum Electrolytic Capacitors. (ECEA-type,±20% Tolerance)

(TABLE-2)

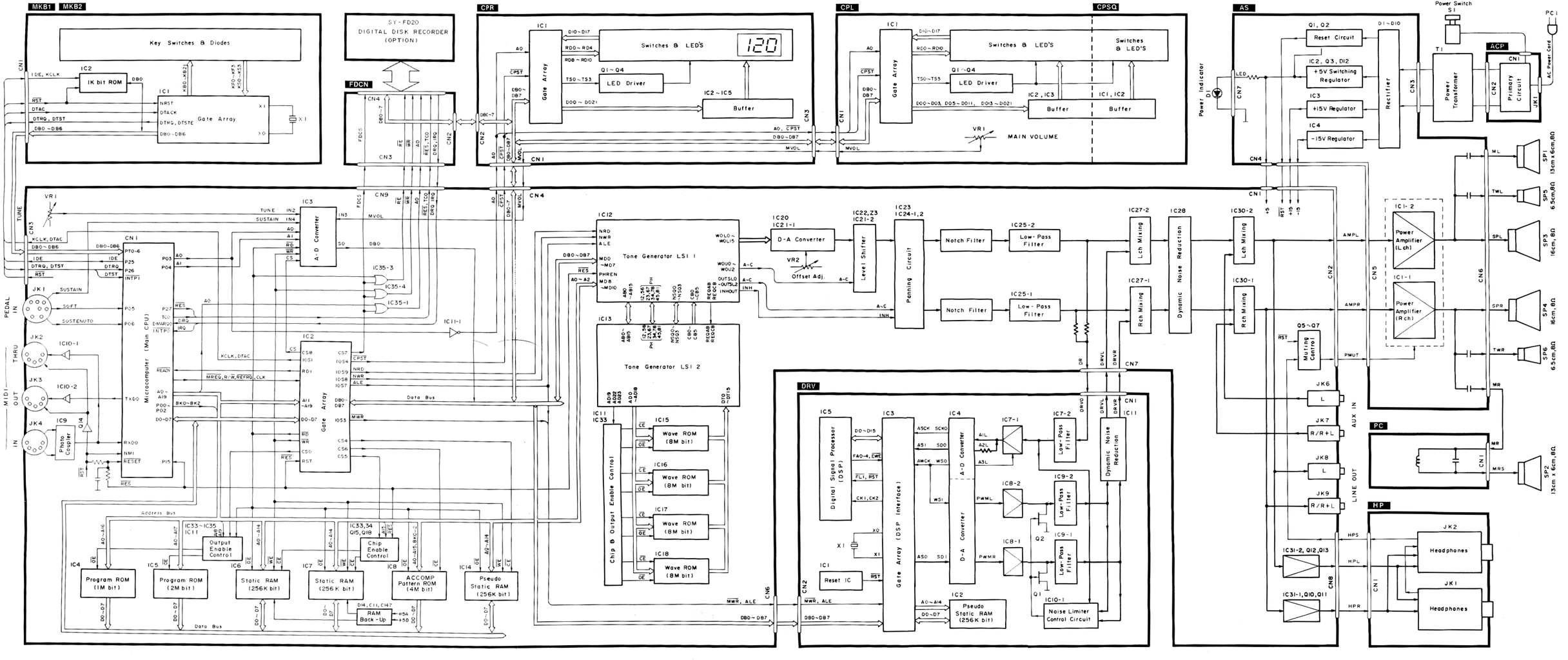
SYMBOL	SPECIFICATION	TYPE
Ⓝ	Non-Polarized Electrolytic Capacitors	ECEA__KN__type
Ⓨ	Non-Polarized Electrolytic (for Network System)	ECEA__Y__type
Ⓜ	Aluminum Electrolytic Capacitors (Low leakage current type)	ECEA__M__type
Ⓩ	Aluminum Electrolytic Capacitors (Low impedance type)	ECEA__Z__type
Ⓣ	Tantalum Solid Electrolytic Capacitors	ECS__type
Ⓣ	Metalized Plastic Film Capacitors (TF Series)	ECQV__type
Ⓣ	Polyester Film Capacitors	ECQB__type
○	Temperature Compensating Ceramic Capacitors	ECC__type
○	High-Dielectric Constant Ceramic Capacitors	ECK__type ECR__type
○	Ceramic Capacitors (Cylinder type)	ECBA__type
	Metalized Polyester Film Capacitors for Across the Line	ECQ__EW__type
	Aluminum Electrolytic Capacitors for Smoothing Circuit	ECES__type

WIRING CONNECTION DIAGRAM

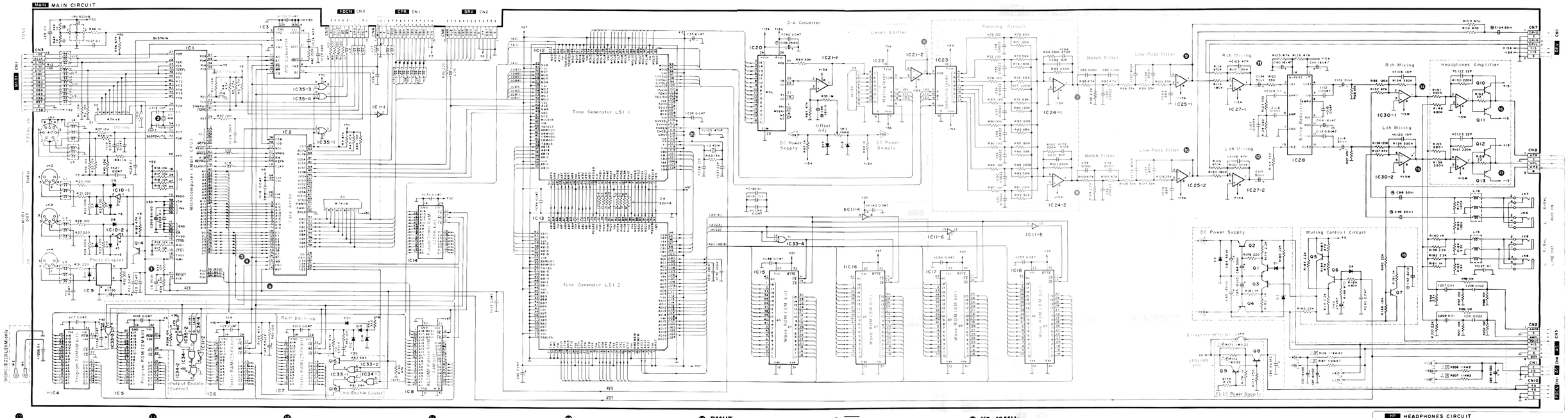


BLOCK DIAGRAM

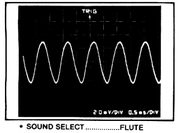
Tone Signals Control Signals



MAIN HP MAIN AND HEADPHONES CIRCUIT DIAGRAM

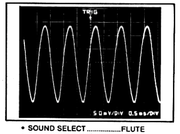


⑫



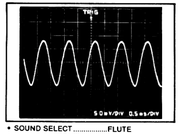
- SOUND SELECT.....FLUTE
- BALANCE (RIGHT).....MAX
- MAIN VOLUME.....MAX
- Keyboard.....C_{82} Key

⑬



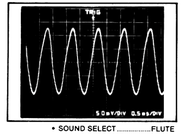
- SOUND SELECT.....FLUTE
- BALANCE (RIGHT).....MAX
- MAIN VOLUME.....MAX
- Keyboard.....C_{82} Key

⑭



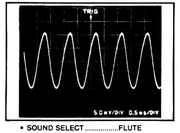
- SOUND SELECT.....FLUTE
- BALANCE (RIGHT).....MAX
- MAIN VOLUME.....MAX
- Keyboard.....C_{82} Key

⑮



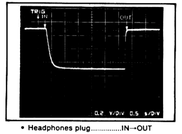
- SOUND SELECT.....FLUTE
- BALANCE (RIGHT).....MAX
- MAIN VOLUME.....MAX
- Keyboard.....C_{82} Key

⑰



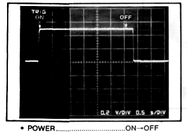
- SOUND SELECT.....FLUTE
- BALANCE (RIGHT).....MAX
- MAIN VOLUME.....MAX
- Keyboard.....C_{82} Key

⑱ PMUT



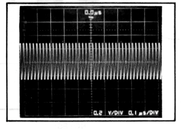
- Headphones plug.....IN→OUT

⑲ $\overline{RST}$

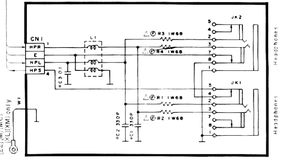


- POWER.....ON→OFF

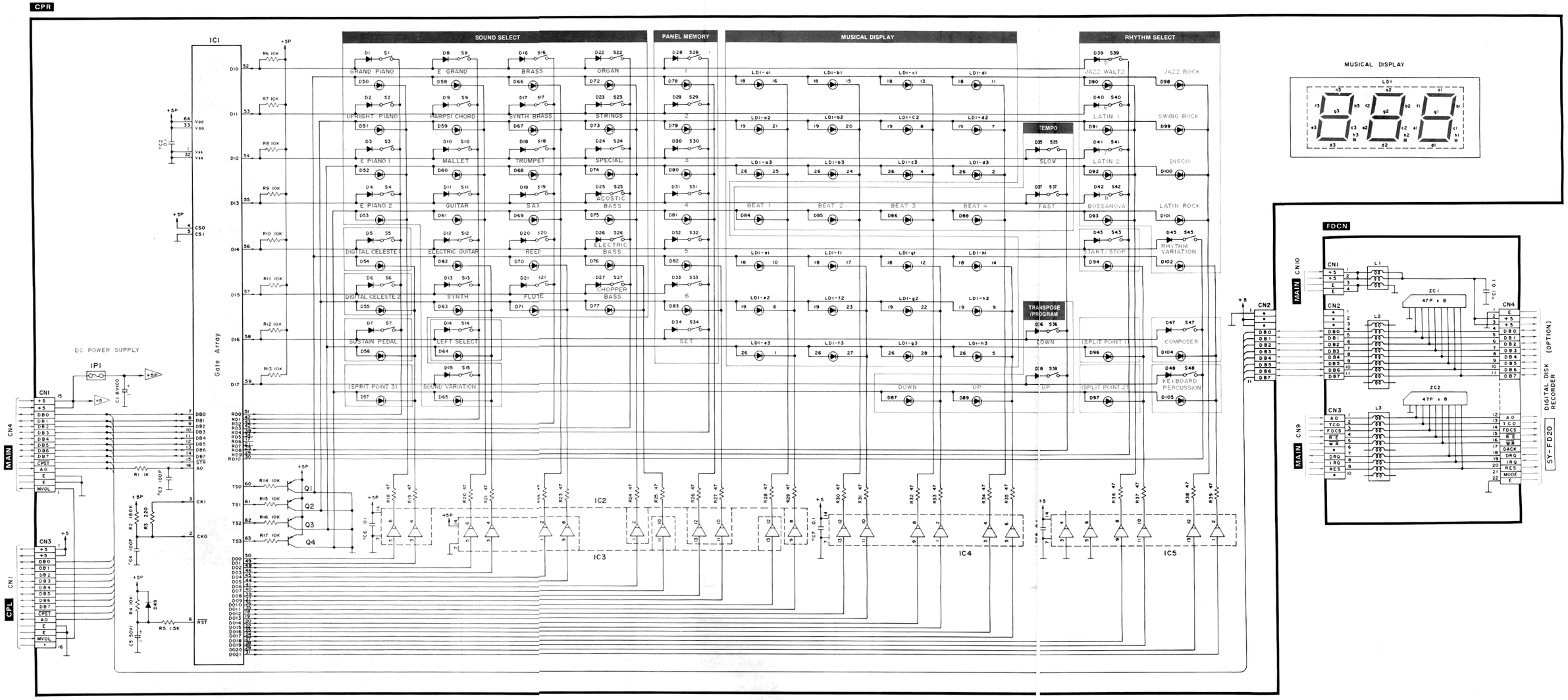
⑳ X2, 40MHz



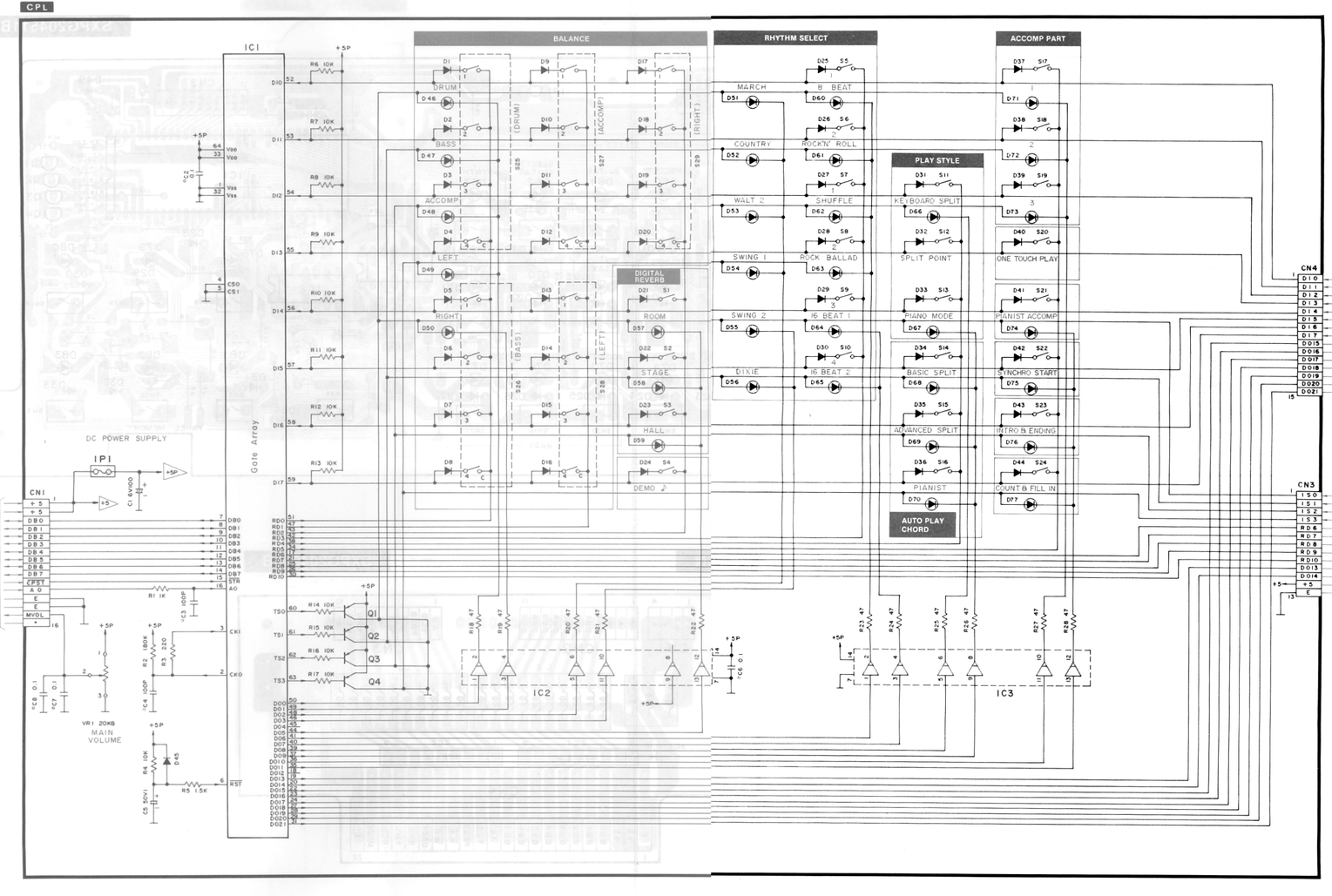
HP HEADPHONES CIRCUIT

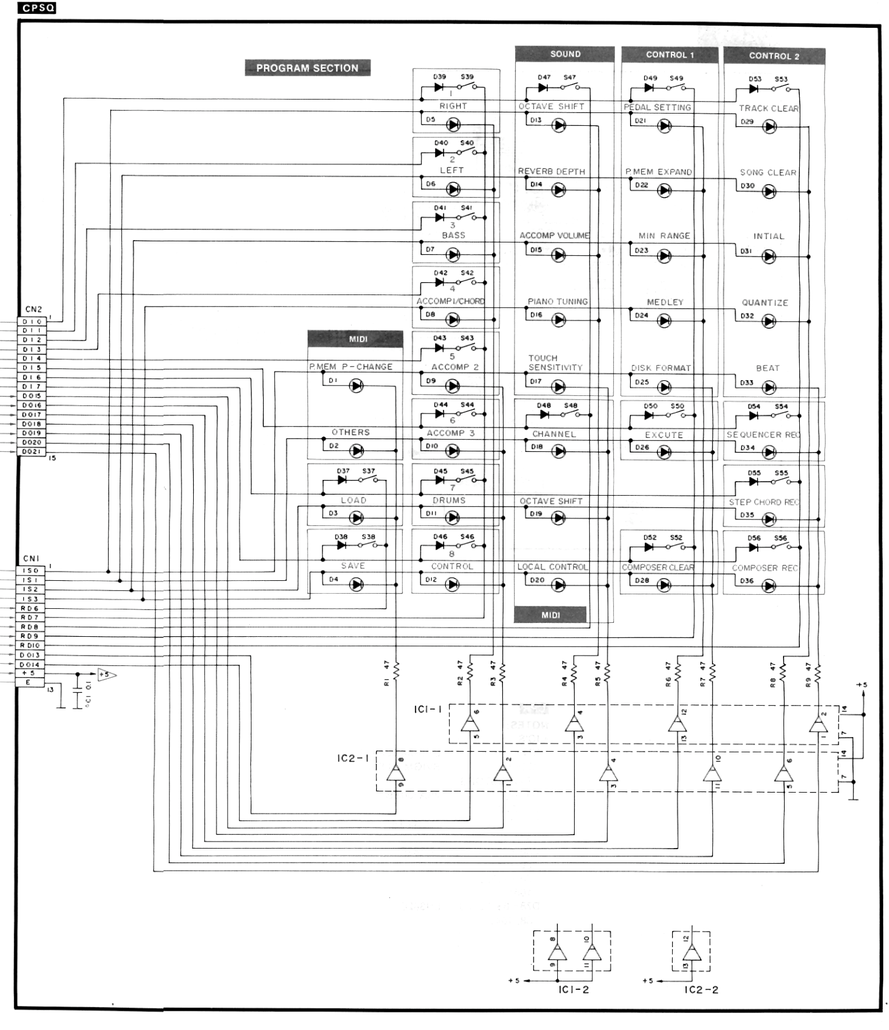


CPR FDCN CONTROL PANEL RIGHT AND FD CONNECTOR CIRCUIT DIAGRAM

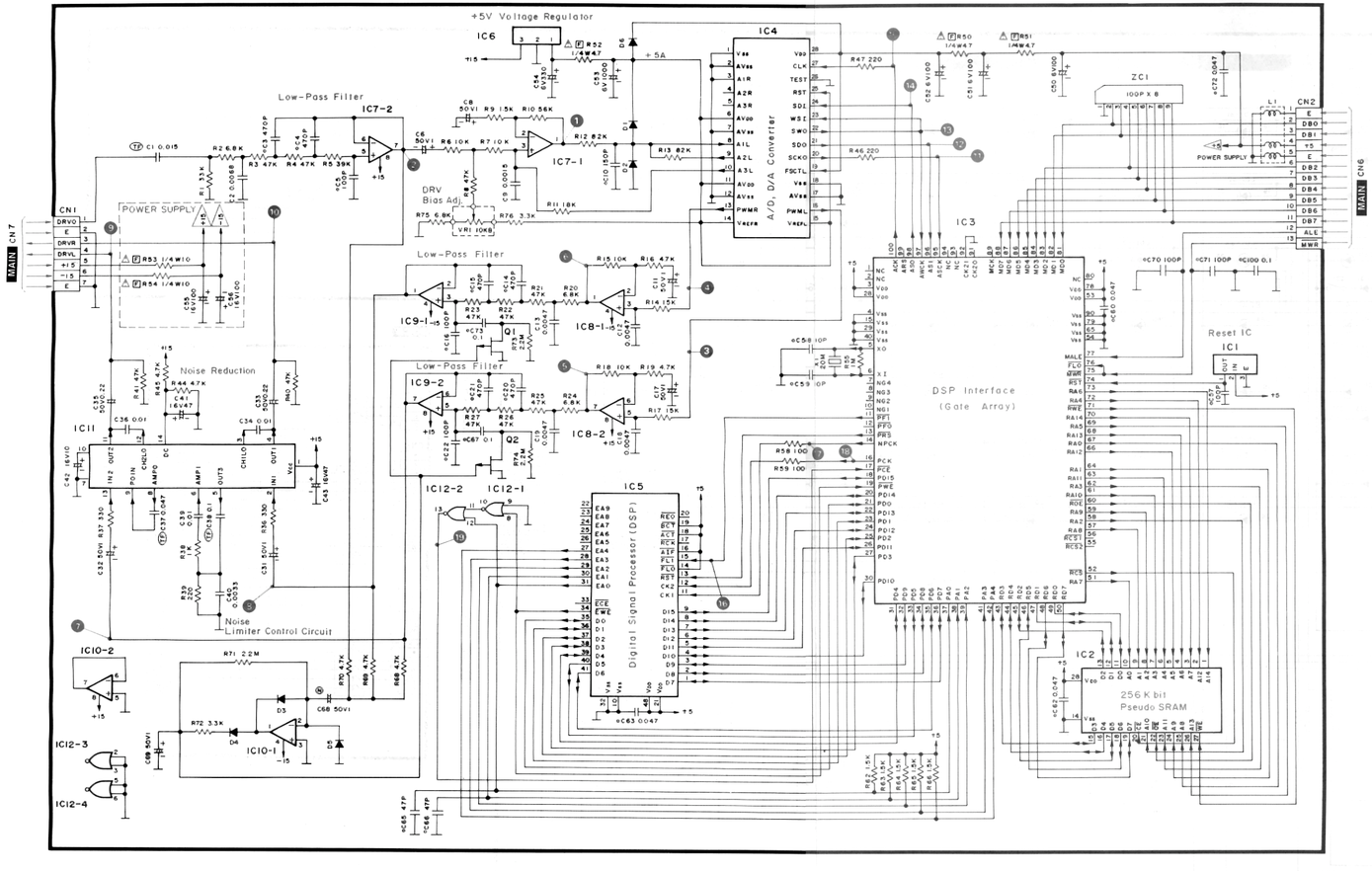


CPL CPSQ CONTROL PANEL LEFT AND SEQUENCER CONTROL CIRCUIT DIAGRAM



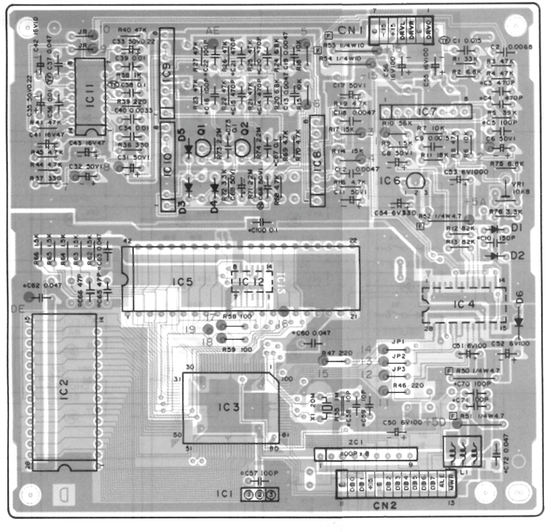


DRV DIGITAL REVERB CIRCUIT DIAGRAM AND CIRCUIT BOARD



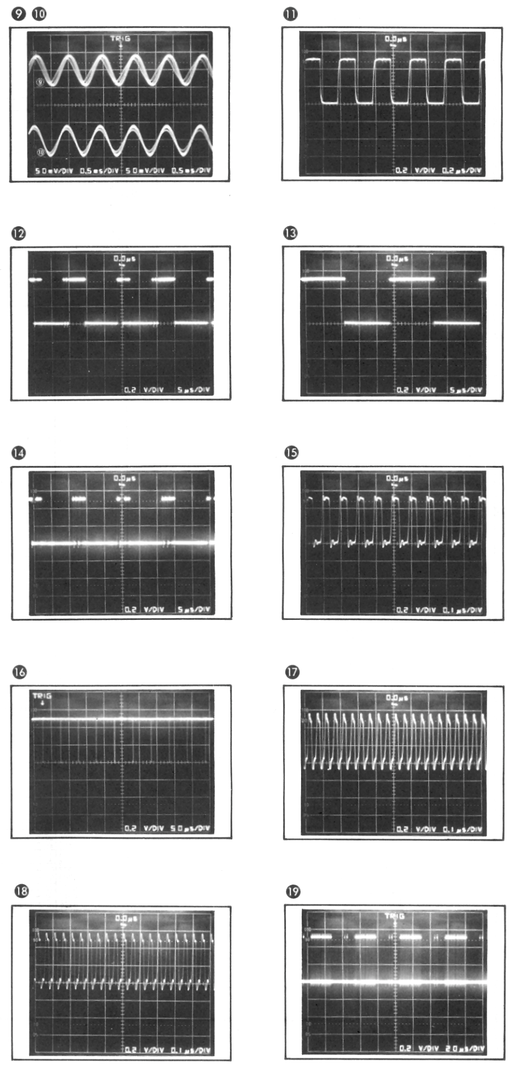
Circuit view on top of P.C.B.

SXPG146041



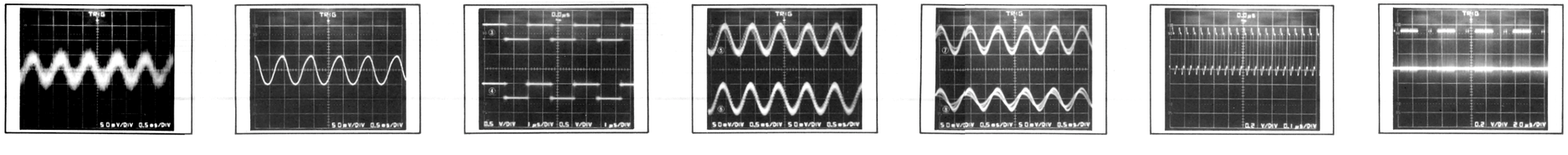
NOTES:

- IC'S
  - IC1: MN1280R
  - IC2: SVIGHM65256
  - IC3: SVIGMB622416
  - IC4: MN8305S
  - IC5: SVIG87064075
  - IC6: SVIGM5278L05
  - IC7: SVIGM5220L
  - IC8~10: SVIGM5218L
  - IC11: SVIGLM1894N
  - IC12: MN74HC02S
- TRANSISTORS
  - Q1, 2: 2SJ105GR
- DIODES
  - D1~5: MA165TA5
  - D6: EK04



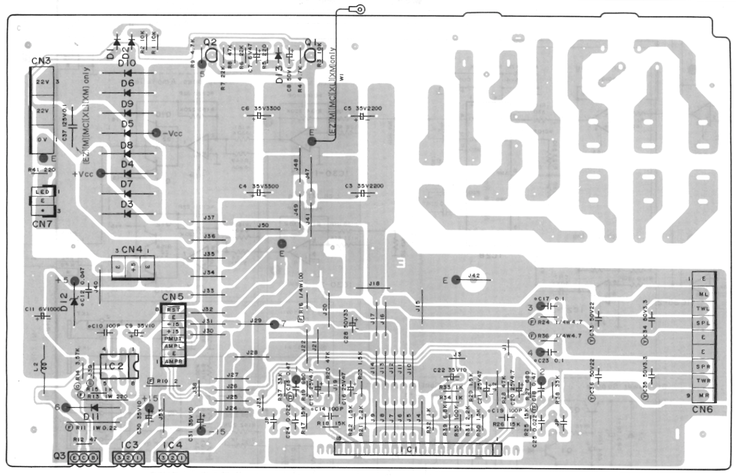
■ Waveform measurement

1. Activate the initial setting method. (Refer to page I-16)
2. Set the touch sensitivity level to the "0". (Refer to page I-16)
3. Set the D. Piano to required mode followings.
   - SOUND SELECT.....FLUTE
   - DIGITAL REVERB.....STAGE
   - BALANCE (RIGHT).....MAX
   - MAIN VOLUME.....MAX
   - Keyboard.....C_{52} Key

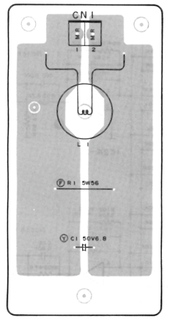


AS ACP PC AMP & POWER SUPPLY, AC POWER SUPPLY AND PEAK CANCELLER CIRCUIT

AS • [EZ] [M] [MC] [XL] [XM] areas **SXPG2037161A** • Other areas **SXPG2037141A**

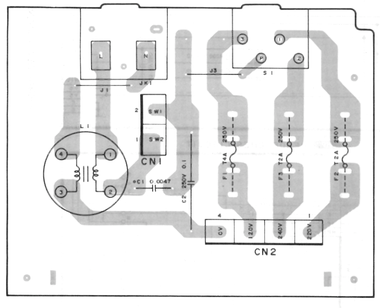


PC **SXPG204721**



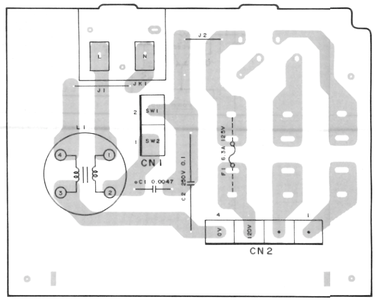
• Except for [M] [MC] [XM] [EH] [XL] [XR] areas **SXPG204911A**

ACP • [XL] [XR] areas **SXPG204941A**



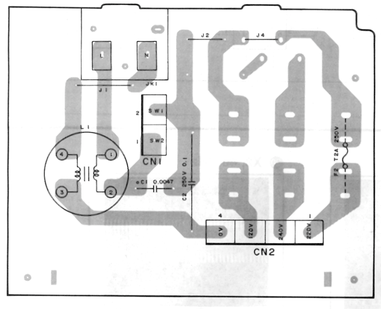
NOTES:
• FUSES
F1: XBA2C40TB0
F2: XBA2C20TB0

ACP • [M] [MC] [XM] areas **SXPG204931A**

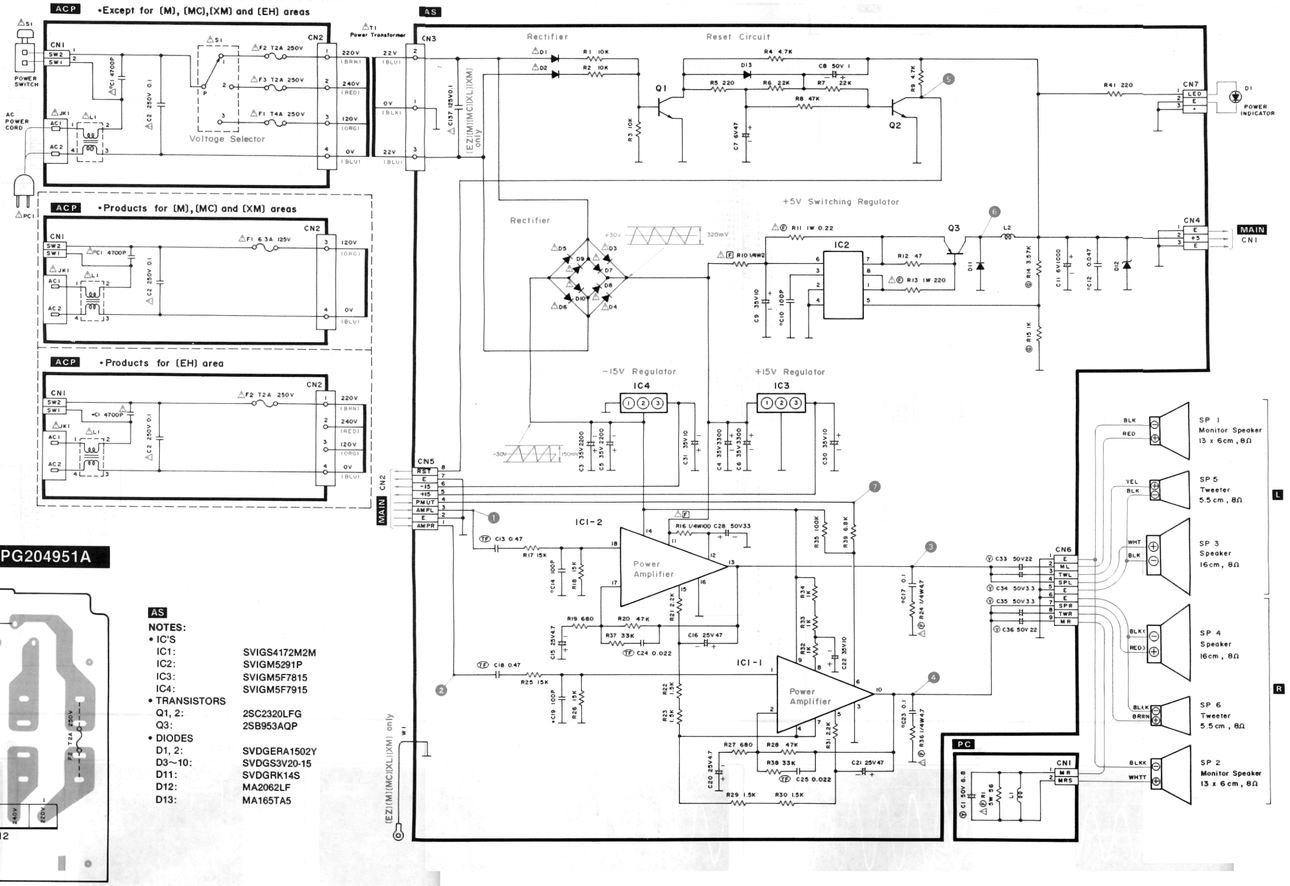


NOTES:
• FUSE
F1: XBA1C63NU100

ACP • [EH] area **SXPG204951A**



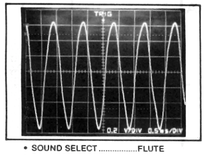
NOTES:
• FUSE
F2: XBA2C20TB0



AS
NOTES:
• IC'S
IC1: SVIGS4172M2M
IC2: SVIGM5291P
IC3: SVIGM5F7815
IC4: SVIGM5F7915
• TRANSISTORS
Q1, 2: 2SC2320LFG
Q3: 2SB953AQP
• DIODES
D1, 2: SVDGERA1502Y
D3~10: SVDGS3V20-15
D11: SVDGRK14S
D12: MA2062LF
D13: MA165TA5

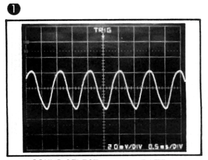
■ Waveform measurement

1. Activate the initial setting method. (Refer to page I-16)
2. Set the touch sensitivity level to the "0". (Refer to page I-16)
3. Set the D. Piano to required mode following each checkpoint(s).



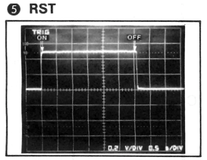
• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

❶



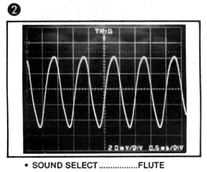
• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

❺ RST



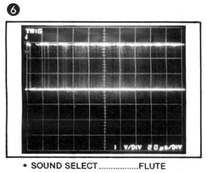
• POWER.....ON→OFF

❷



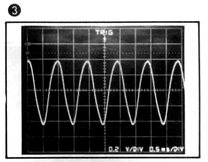
• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

❻



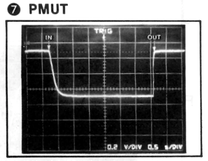
• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

❸



• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

❼ PMUT



• Headphones plug.....IN→OUT

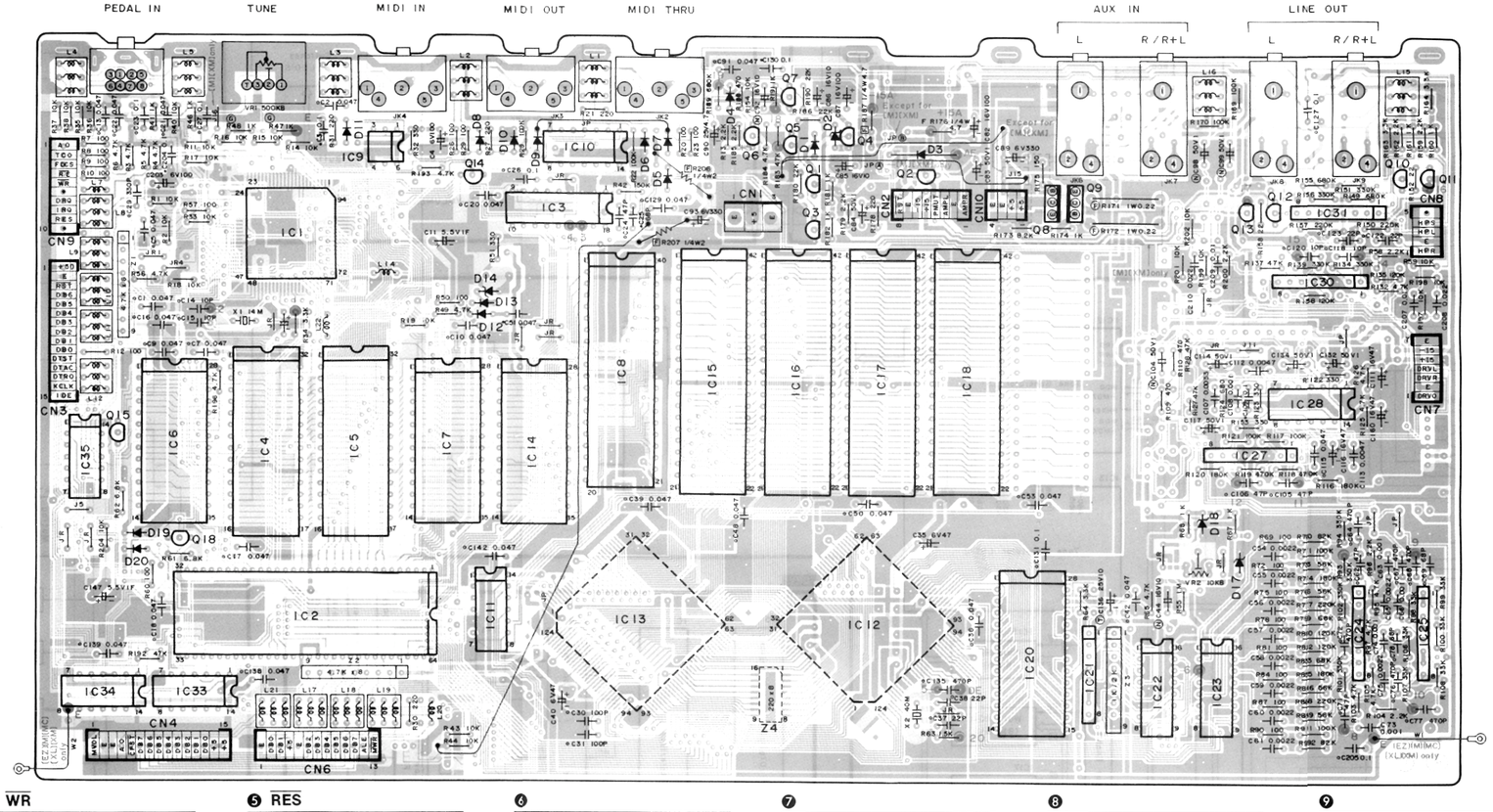
MAIN HP MAIN AND HEADPHONES CIRCUIT BOARD

＊Main P.C.B. comparison chart by area.

Area	P.C.B. No.	Q8, 9	R171~R175	JP ⓐ	J15, J16, JP ⓑ	W1, 2
[M] [XM]	SXPG204361	○	○	○	×	○
[EZ] [MC] [XL]	SXPG2043151	×	×	×	○	×
Other areas	SXPG204321					

MAIN MAIN CIRCUIT BOARD

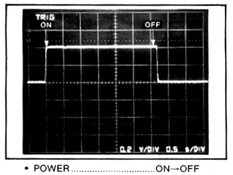
Circuit view on top of P.C.B. • [M] [XM] areas **SXPG204361** • [EZ] [MC] [XL] areas **SXPG2043151** • Other areas **SXPG204321**



■ Waveform measurement

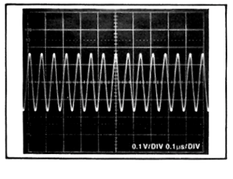
1. Activate the initial setting method. (Refer to page I-16)
2. Set the touch sensitivity level to the "0". (Refer to page I-16)
3. Set the D. Piano to required mode following each checkpoint(s).

❶

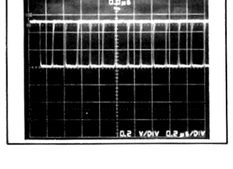


• POWER.....ON→OFF

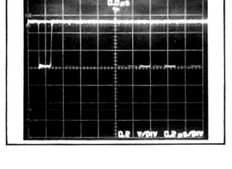
❷ X1, 14MHz



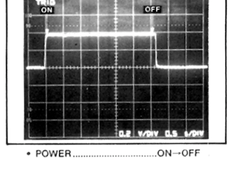
❸ $\overline{RD}$



❹ $\overline{WR}$

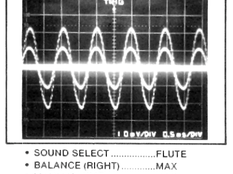


❺ $\overline{RES}$



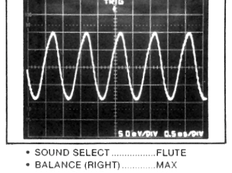
• POWER.....ON→OFF

❻



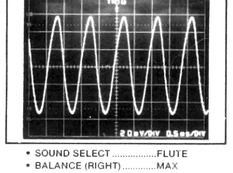
• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

❼



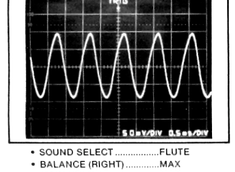
• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

❽



• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

❾

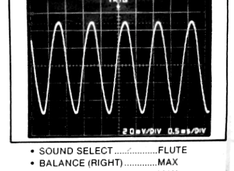


• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

❿

• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

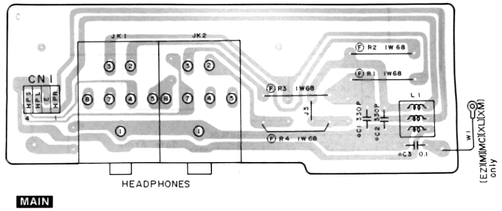
⓫



• SOUND SELECT.....FLUTE
• BALANCE (RIGHT).....MAX
• MAIN VOLUME.....MAX
• Keyboard.....C_{52} Key

HP HEADPHONES CIRCUIT BOARD

• [EZ] [M] [MC] [XL] [XM] areas **SXPG203741B**
• other areas **SXPG203721B**



MAIN

NOTES:

• IC'S

IC1:	SVIGD70320GJ
IC2:	SVIGMB621407
IC3:	SVIGMSM6253
IC4:	QSIGAR35AX0
IC5:	QSIGBR35AX0
IC6, 7:	SVIGM5256BLL
IC8:	QSIGH3C04C44
IC9:	SVIGTLP513
IC10:	SVIGM74LS07
IC11:	SVIGTC40H004
IC12:	MN73012PGC
IC13:	MN73013PGD
IC14:	SVIGHM65256
IC15:	QSIGH3C08C26
IC16:	QSIGH3C08C45
IC17:	QSIGH3C08C71
IC18:	QSIGU3C08026
IC20:	SVIGPCM54
IC21:	SVIGM5238L
IC22, 23:	SVIGT74H4051
IC24, 25, 27, 30, 31:	SVIGM5218L
IC28:	SVIGLM1894N
IC33, 35:	SVIGTC40H032
IC34:	SVIGTC40H000

• TRANSISTORS

Q1, 2, 6:	2SC2320LFG
Q3~5, 7, 14:	2SA1015-GR
Q8, 9: [XL] [XM]	2SA1643
Q10, 12:	2SC3940ARS
Q11, 13:	2SA1534ARS
Q15, 18:	2SC1047C

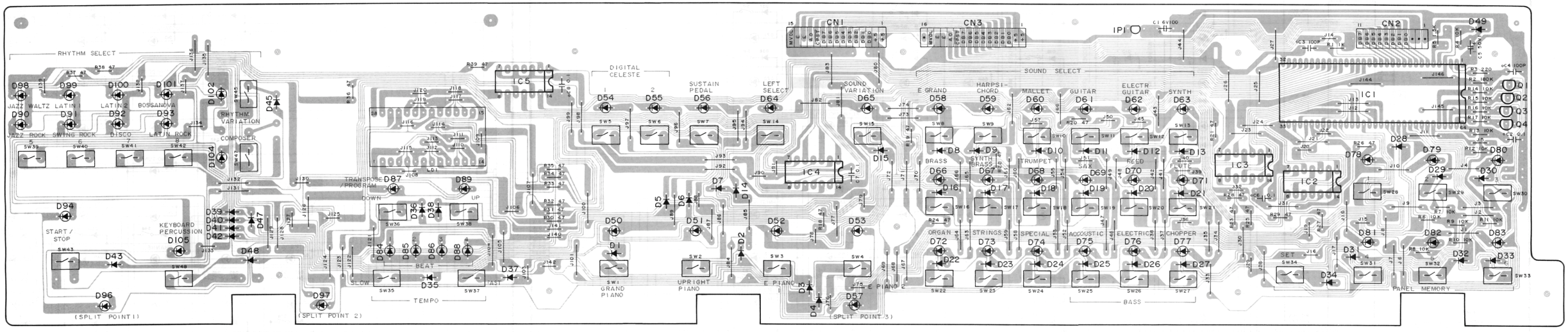
• DIODES

D1, 4~13, 19, 20:	MA165TA5
D2:	MA4062
D3:	EK04
D14:	MA4056
D17, 18:	MA4051MTA

CPR FDCN CONTROL PANEL RIGHT AND FD CONNECTOR CIRCUIT BOARD

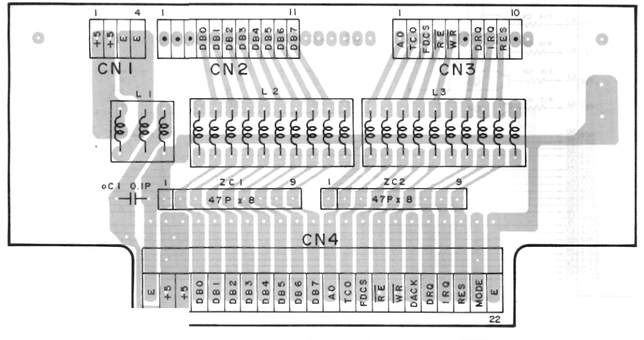
CPR

SXPG204511B



FDCN

SXPG204911B



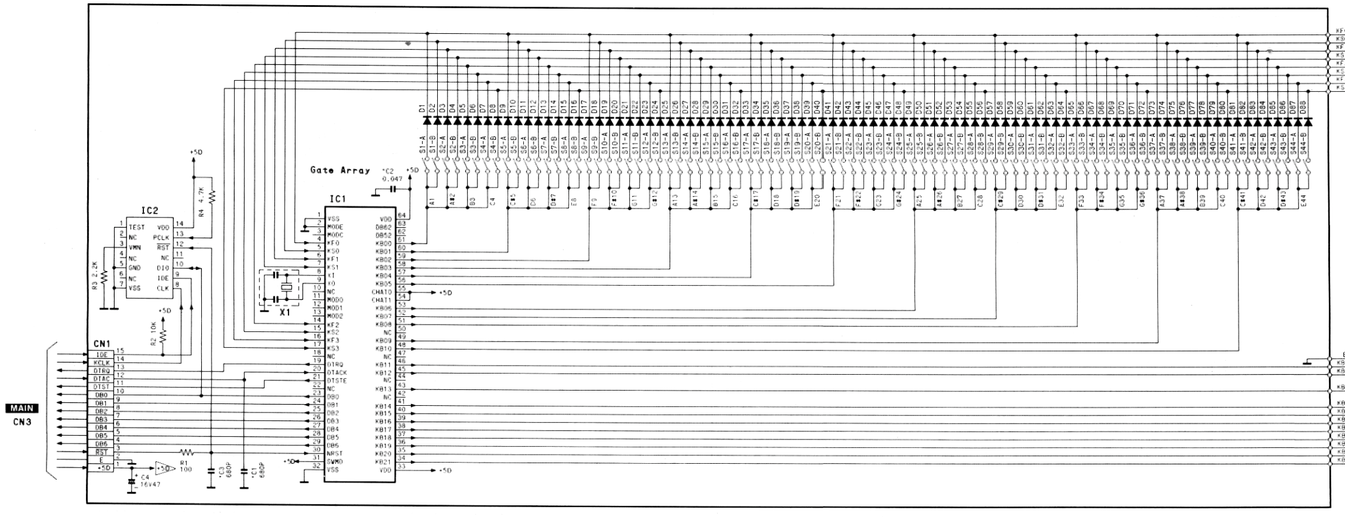
CPR

NOTES:

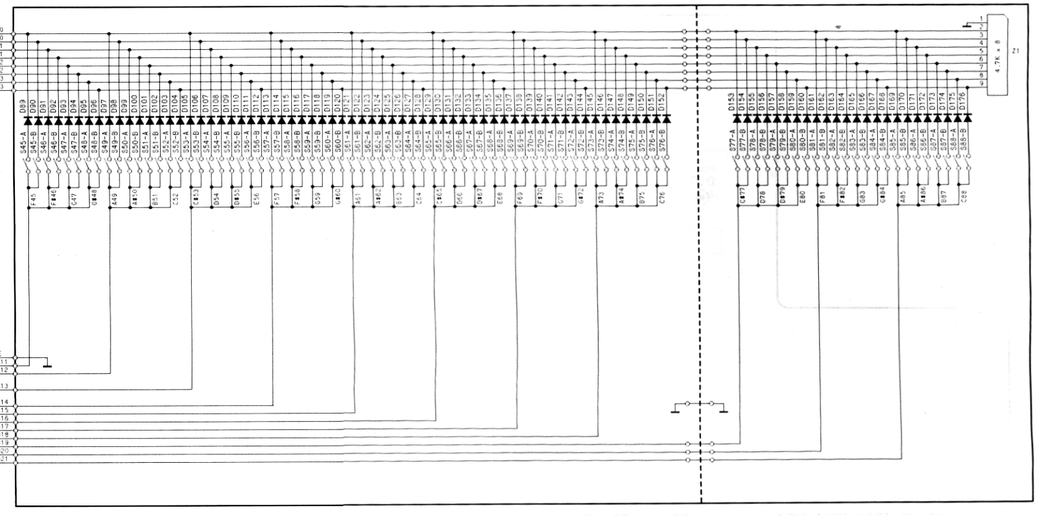
- IC'S
  - IC1: SVIGM603A121
  - IC2~5: SVIGM74LS07
- TRANSISTORS
  - Q1~4: 2SA830SB
- DIODES
  - D1~43, 45, 47~49: MA165TA5
  - D50~77, 84, 87, 89~94, 96~102, 105: LN282R
  - D78~83, 85, 86, 88, 104: LN382G

MKB1 MKB2 MANUAL KEYBOARD 1, 2 CIRCUIT DIAGRAM AND CIRCUIT BOARD

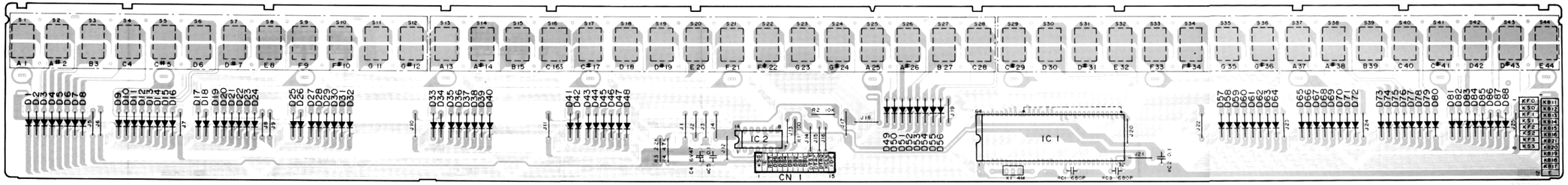
MKB1 MANUAL KEYBOARD 1 CIRCUIT DIAGRAM



MKB2 MANUAL KEYBOARD 2 CIRCUIT DIAGRAM



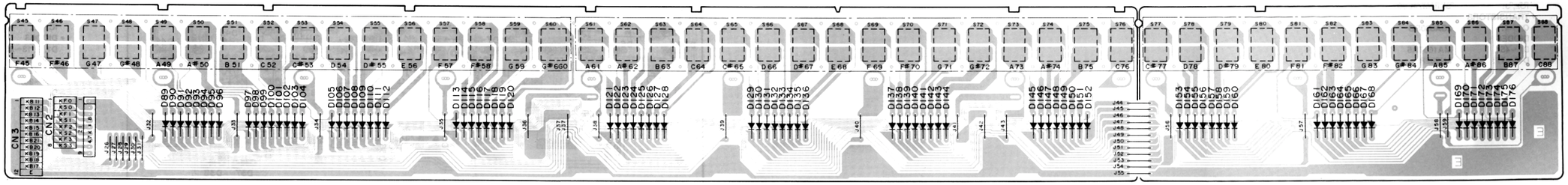
MKB1 MANUAL KEYBOARD 1 CIRCUIT BOARD



SXPG203811A

NOTES:
- IC'S
  - IC1: MN50020PGV
  - IC2: MN1231
- DIODES
  - D1~88: MA162A

MKB2 MANUAL KEYBOARD 2 CIRCUIT BOARD



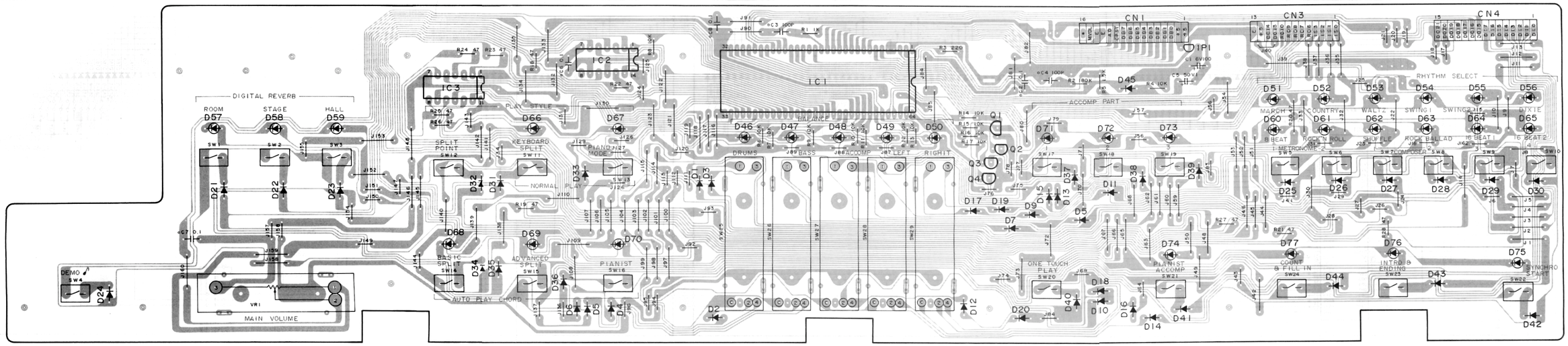
SXPG203811B

NOTES:
- DIODES
  - D89~176: MA162A

CPL CPSQ CONTROL PANEL LEFT AND SEQUENCER CONTROL CIRCUIT BOARD

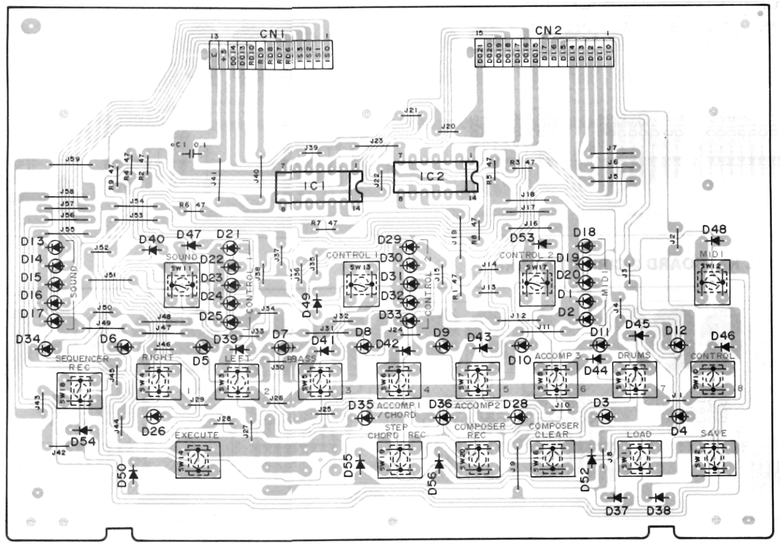
CPL

SXPG204511A



CPSQ

SXPG205211



CPL

NOTES:

- IC'S
  - IC1: SVIGM603A121
  - IC2, 3: SVIGM74LS07
- TRANSISTORS
  - Q1~4: 2SA830SB
- DIODES
  - D1~45: MA165TA5
  - D46~77: LN282R

CPSQ

NOTES:

- IC'S
  - IC1, 2: SVIGM74LS07
- DIODES
  - D1, 2, 13~25, 29~33: LN282R
  - D3~12, 26, 28, 34~36: LN382G
  - D37~50, 52~56: MA165TA5

REPLACEMENT PARTS LIST.....P.C.B. and Wiring Parts

Notes:

1. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.
2. The "S" mark is for a service standard part.
3. The P.C.B. part number is service standard part and may differ from production part. However, the standard P.C.B. is exchangeable to the original P.C.B. without any change.
4. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
5. ○ mark are new parts.
6. For part No. with area mark, check the area when placing an order.

■ PRINTED CIRCUIT BOARD

	NLA	Area	Part No.	Description	Per/Set
○	NLA	M XM	SXPG204361	MAIN	1
Ⓢ	NLA	Others	SXPG2043151	MAIN	1
Ⓢ	NLA		SXPG203741B	HP	1
○	NLA	M MC XM	SXPG204931A	ACP	1
○	NLA	XL XR	SXPG204941A	ACP	1
○	NLA	EH	SXPG204951A	ACP	1
○	NLA	Others	SXPG204911A	ACP	1
Ⓢ	NLA		SXPG2037161A	AS	1
○	NLA		SXPG204721	PC	1
	NLA		SXPG146041	DRV	1
○	NLA		SXPG204511B	CPR	1
○	NLA		SXPG204911B	FDCN	1
○	NLA		SXPG204511A	CPL	1
○	NLA		SXPG205211	CPSQ	1
	NLA		SXPG203811A	MKB1	1
	NLA		SXPG203811B	MKB2	1

MAIN MAIN CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGD70320GJ	16 bit Microcomputer	1
IC2	SVIGMB621407	Gate Array	1
IC3	SVIGMSM6253	A/D Converter	1
○ IC4	QSIGAR35AX0	1M bit Programmed EP ROM	1
○ IC5	QSIGBR35AX0	2M bit Programmed EP ROM	1
IC6, 7	SVIGM5256BLL	256K bit Static RAM	2
○ IC8	QSIGH3C04C44	4M bit ACCOMP Pattern ROM	1
IC9	SVIGTLP513	Photo Coupler	1
IC10	SVIGM74LS07	Hex Buffers (O.C.)	1
IC11	SVIGTC40H004	Hex Inverters	1
IC12	MN73012PGC	Tone Generator LSI 1	1
IC13	MN73013PGD	Tone Generator LSI 2	1
IC14	SVIGHM65256	256K bit Pseudo Static RAM	1
IC15	QSIGH3C08C26	8M bit Wave ROM	1
IC16	QSIGH3C08C45	8M bit Wave ROM	1
IC17	QSIGH3C08C71	8M bit Wave ROM	1
○ IC18	QSIGU3C08026	8M bit Wave ROM	1
IC20	SVIGPCM54	D-A Converter	1
IC21	SVIGM5238L	Operational Amplifier	1
IC22, 23	SVIGT74H4051	8-channel Multiplexer	2
IC24, 25, 27, 30, 31	SVIGM5218L	Operational Amplifier	5
IC28	SVIGLM1894N	Dynamic Noise Reduction	1
IC33, 35	SVIGTC40H032	Quad 2-input OR Gates	2
IC34	SVIGTC40H000	Quad 2-input NAND Gates	1

Ref. No.	Part No.	Description	Per/Set
TRANSISTORS			
S Q1, 2, 6	2SC2320LFG	2SC1310FG (SUB. Part)	3
S Q3~5, 7, 14	2SA1015-GR	2SA933STRS (SUB. Part)	5
○ Q8, 9 M XM	2SA1643		2
Q10, 12	2SC3940ARS		2
Q11, 13	2SA1534ARS		2
Q15, 18	2SC1047C		2
DIODES			
D1, 4~13, 19, 20	MA165TA5		13
D2	MA4062	Zener, 6.2V	1
D3	EK04		1
D14	MA4056	Zener, 5.6V	1
D17, 18	MA4051MTA	Zener, 5.1V	2
OSCILLATOR			
X1	QSXG1A1400A	14MHz, Quartz Oscillator	1
X2	QSXG1B4000A	40MHz, Quartz Oscillator	1
COMPONENT COMBINATIONS			
Z1, 2	EXBPI8472JM	4.7KΩ×8	2
Z3	EXAMR14A1002	1KΩ/2KΩ, Ladder Network	1
Z4	EXBM16V221JA	220Ω×8	1
COILS			
L1~5, 15, 16	QLQGT1B600MA	Coil	21
L7, 14, 20, 22	QLQGT1B600MA	Coil	4
L8~12, 17~19, 21	SLQG15W34DPQ	Coil	9
JACKS			
JK1	QJSG002AA	Pedal IN	1
JK2~4	SJSG1370A	MIDI (THRU, OUT, IN)	3
JK6~9	SJJG400A	AUX IN, LINE OUT	4
VARIABLE RESISTOR			
VR1	EVJ01PF25B55	500KΩ B, TUNE	1
SEMI-FIXED RESISTOR			
VR2	EVND4AA00B14	10KΩ B, Offset Adj.	1
WIRES			
W1, 2	QEXG01001RA	[M][MC][EZ][XL][XM] only	2

RESISTORS

Ref. No.	Part No.	Description	Per/Set
R1, 2	ERDS2TJ103	10KΩ	2
R3~6	ERDS2TJ472	4.7KΩ	4
R7~10	ERDS2TJ101	100Ω	4
R11	ERDS2TJ103	10KΩ	1
R12	ERDS2TJ101	100Ω	1
R13	ERDS2TJ222	2.2KΩ	1
R14~19	ERDS2TJ103	10KΩ	6
R20	ERDS2TJ101	100Ω	1
R21	ERDS2TJ221	220Ω	1
R22	ERDS2TJ104	100KΩ	1
R23	ERDS2TJ101	100Ω	1
R26	ERDS2TJ101	100Ω	1
R27	ERDS2TJ221	220Ω	1
R28	ERDS2TJ104	100KΩ	1
R29	ERDS2TJ101	100Ω	1
R30, 31	ERDS2TJ221	220Ω	2
R32	ERDS2TJ331	330Ω	1
R33	ERDS2TJ103	10KΩ	1
R34	ERDS2TJ332	3.3KΩ	1
R35~38	ERDS2TJ103	10KΩ	4
R40	ERDS2TJ103	10KΩ	1
R41	ERDS2TJ102	1KΩ	1
R42	ERDS2TJ154	150KΩ	1
R43, 44	ERDS2TJ103	10KΩ	2
R46	ERDS2TJ102	1KΩ	1
R47, 48	ER0S2TKF1001	1KΩ, ±1%	2
R49	ERDS2TJ472	4.7KΩ	1
R50	ERDS2TJ101	100Ω	1
R51	ERDS2TJ331	330Ω	1
R55	ERDS2TJ105	1MΩ	1
R56	ERDS2TJ472	4.7KΩ	1
R57	ERDS2TJ101	100Ω	1
R58	ERDS2TJ222	2.2KΩ	1
R59	ERDS2TJ103	10KΩ	1
R60	ERDS2TJ101	100Ω	1
R61, 62	ERDS2TJ682	6.8KΩ	2
R63	ERDS2TJ152	1.5KΩ	1
R64	ERDS2TJ332	3.3KΩ	1
R65	ERDS2TJ472	4.7KΩ	1
R67, 68	ERDS2TJ102	1KΩ	2
R69	ERDS2TJ101	100Ω	1
R70	ERDS2TJ823	82KΩ	1
R71	ERDS2TJ104	100KΩ	1
R72	ERDS2TJ101	100Ω	1
R73	ERDS2TJ563	56KΩ	1
R74	ERDS2TJ184	180KΩ	1
R75	ERDS2TJ101	100Ω	1
R76	ERDS2TJ563	56KΩ	1
R77	ERDS2TJ224	220KΩ	1
R78	ERDS2TJ101	100Ω	1
R79	ERDS2TJ683	68KΩ	1
R80	ERDS2TJ124	120KΩ	1
R81	ERDS2TJ101	100Ω	1
R82	ERDS2TJ124	120KΩ	1
R83	ERDS2TJ683	68KΩ	1
R84	ERDS2TJ101	100Ω	1
R85	ERDS2TJ184	180KΩ	1
R86	ERDS2TJ563	56KΩ	1
R87	ERDS2TJ101	100Ω	1
R88	ERDS2TJ224	220KΩ	1
R89	ERDS2TJ563	56KΩ	1
R90	ERDS2TJ101	100Ω	1
R91	ERDS2TJ104	100KΩ	1
R92	ERDS2TJ823	82KΩ	1
R93, 94	ERDS2TJ334	330KΩ	2
R95	ERDS2TJ472	4.7KΩ	1
R96	ERDS2TJ222	2.2KΩ	1
R97	ERDS2TJ472	4.7KΩ	1
R98~100	ERDS2TJ333	33KΩ	3
R101, 102	ERDS2TJ334	330KΩ	2
R103	ERDS2TJ472	4.7KΩ	1
R104	ERDS2TJ222	2.2KΩ	1
R105	ERDS2TJ472	4.7KΩ	1
R106~108	ERDS2TJ333	33KΩ	3
R109, 110	ERDS2TJ471	470Ω	2
R116	ERDS2TJ184	180KΩ	1
R117	ERDS2TJ104	100KΩ	1
R118, 119	ERDS2TJ474	470KΩ	2
R120	ERDS2TJ184	180KΩ	1
R121	ERDS2TJ104	100KΩ	1
R122, 123	ERDS2TJ331	330Ω	2
R124	ERDS2TJ681	680Ω	1
R125, 126	ERDS2TJ472	4.7KΩ	2
R127, 128	ERDS2TJ473	47KΩ	2
R132	ERDS2TJ473	47KΩ	1
R134	ERDS2TJ334	330KΩ	1
R135	ERDS2TJ124	120KΩ	1
R137	ERDS2TJ473	47KΩ	1
R138	ERDS2TJ124	120KΩ	1
R139	ERDS2TJ334	330KΩ	1
R149	ERDS2TJ684	680KΩ	1
R150	ERDS2TJ224	220KΩ	1
R151	ERDS2TJ334	330KΩ	1
R152	ERDS2TJ220	22Ω	1
R153	ERDS2TJ331	330Ω	1
R154	ERDS2TJ103	10KΩ	1
R155	ERDS2TJ684	680KΩ	1
R156	ERDS2TJ334	330KΩ	1
R157	ERDS2TJ224	220KΩ	1
R158	ERDS2TJ220	22Ω	1
R159	ERDS2TJ222	2.2KΩ	1
R160, 161	ERDS2TJ102	1KΩ	2
R162	ERDS2TJ222	2.2KΩ	1
R163, 164	ERDS2TJ332	3.3KΩ	2
R169, 170	ERDS2TJ104	100KΩ	2
R171, 172 ⚠ M XM	ERX1ANJPR22S	0.22Ω, 1W, Flame-Proof	2
R173 M XM	ERDS2TJ822	8.2KΩ	1
R174 M XM	ERDS2TJ102	1KΩ	1
R175 M XM	ERDS2TJ151	150Ω	1
R176 ⚠	ERD2FCJ4R7	4.7Ω, 1/4W, Fuse Type	1
R178	ERDS2TJ221	220Ω	1
R179	ERDS2TJ222	2.2KΩ	1
R180	ERDS2TJ223	22KΩ	1
R181, 182	ERDS2TJ102	1KΩ	2
R183	ERDS2TJ473	47KΩ	1
R184	ERDS2TJ472	4.7KΩ	1
R185	ERDS2TJ222	2.2KΩ	1
R186	ERDS2TJ223	22KΩ	1
R187 ⚠	ERD2FCJ4R7	4.7Ω, 1/4W, Fuse Type	1
R188	ERDS2TJ471	470Ω	1
R189	ERDS2TJ684	680KΩ	1
R190	ERDS2TJ223	22KΩ	1
R191	ERDS2TJ102	1KΩ	1
R192	ERDS2TJ473	47KΩ	1
R193	ERDS2TJ472	4.7KΩ	1
R196	ERDS2TJ472	4.7KΩ	1
R197~199	ERDS2TJ103	10KΩ	3
R200	ERDS2TJ222	2.2KΩ	1
R201, 202	ERDS2TJ103	10KΩ	2
R204	ERDS2TJ103	10KΩ	1
R206, 207 ⚠	ERQ14AJ2R0	2Ω, 1/4W, Fuse Type	2

Ref. No.	Part No.	Description	Per/Set
CAPACITORS			
C1, 2	ECKR1E473ZV	0.047µF	2
C3	ECRR1H104ZF	0.1µF	1
C4	ECEA0JKA101	100µF, 6.3V	1
C5	ECKR1E473ZV	0.047µF	1
C6	ECEA1HKA010	1µF, 50V	1
C7	ECKR1E473ZV	0.047µF	1
C9, 10	ECKR1E473ZV	0.047µF	2
C11	EECF5R5U105	1F, 5.5V, Memory Back-up	1
C13	ECKR1E473ZV	0.047µF	1
C14, 15	ECCR1H030C	3pF	2
C16～18	ECKR1E473ZV	0.047µF	3
C20～22	ECKR1E473ZV	0.047µF	3
C23	ECRR1H104ZF	0.1µF	1
C24	ECCR1H470J	47pF	1
C25	ECCR1H680J	68pF	1
C26, 27	ECRR1H104ZF	0.1µF	2
C29	ECCR1H331J	330pF	1
C30, 31	ECCR1H101J	100pF	2
C35	ECEA0JKA470	47µF, 6.3V	1
C36	ECKR1E473ZV	0.047µF	1
C37, 38	ECCR1H220J	22pF	2
C39	ECKR1E473ZV	0.047µF	1
C40	ECEA0JKA470	47µF, 6.3V	1
C42	ECKR1E473ZV	0.047µF	1
C44	ECEA1CKN100	10µF, 16V	1
C48	ECKR1E473ZV	0.047µF	1
C50, 51	ECKR1E473ZV	0.047µF	2
C53	ECKR1E473ZV	0.047µF	1
C54～61	ECQG1H222KZ	0.0022µF	8
C62	ECCR1H470J	47pF	1
C63	ECQG1H102KZ	0.001µF	1
C64	ECCR1H471J	470pF	1
C65	ECQG1H222KZ	0.0022µF	1
C66	ECQG1H102KZ	0.001µF	1
C67, 68	ECCR1H471J	470pF	2
C69	ECCR1H680J	68pF	1
C71	ECCR1H470J	47pF	1
C72	ECCR1H471J	470pF	1
C73, 74	ECQG1H102KZ	0.001µF	2
C75	ECQG1H222KZ	0.0022µF	1
C76, 77	ECCR1H471J	470pF	2
C78	ECCR1H680J	68pF	1
C82	ECEA1CKA101	100µF, 16V	1
C83, 84	ECEA1HKA010	1µF, 50V	2
C85, 86	ECEA1CKA100	10µF, 16V	2
C87	ECEA1CKA101	100µF, 16V	1
C89	ECEA0JKA331	330µF, 6.3V	1
C90	ECEA1EKA4R7	4.7µF, 25V	1
C91	ECKR1E473ZV	0.047µF	1
C92	ECEA1CKN100	10µF, 16V	1
C93	ECEA0JKA331	330µF, 6.3V	1
C98, 99	ECEA1HKN010	1µF, 50V	2
C104	ECEA1HKN010	1µF, 50V	1
C105, 106	ECCR1H470J	47pF	2
C107	ECQG1H332KZ	0.0033µF	1
C108	ECQG1H102KZ	0.001µF	1
C109	ECRR1H104ZF	0.1µF	1
C111	ECEA1CKA470	47µF, 16V	1
C112, 113	ECQG1H472KZ	0.0047µF	2
C114	ECEA1HKA010	1µF, 50V	1
C115	ECKR1E473ZV	0.047µF	1
C116	ECEA1CKA470	47µF, 16V	1
C117	ECEA1HKA010	1µF, 50V	1
C118	ECCR1H100D	10pF	1
C120	ECCR1H100D	10pF	1
C122, 123	ECCR1H220J	22pF	2
C127	ECRR1H104ZF	0.1µF	1
C130, 131	ECRR1H104ZF	0.1µF	2
C132	ECEA1HKA010	1µF, 50V	1
C134	ECEA1HKA010	1µF, 50V	1
C135	ECCR1H471J	470pF	1
C136	ECSF1EE106	10µF, 25V	1
C138, 139	ECKR1E473ZV	0.047µF	2
C142	ECKR1E473ZV	0.047µF	1
C147	EECF5R5U105	1F, 5.5V, Memory Back-up	1
C160	ECEA1CKA470	47µF, 16V	1
C203	ECEA0JKA101	100µF, 6.3V	1
C204, 205	ECRR1H104ZF	0.1µF	2
C207	ECQM1H103KV	0.01µF	1
C208	ECQM1H223KV	0.022µF	1
C209	ECQM1H103KV	0.01µF	1
C210	ECQM1H223KV	0.022µF	1

HP HEADPHONES CIRCUIT

Ref. No.	Part No.	Description	Per/Set
COIL			
L1	SLQG15W34DPQ	Coil	1
JACKS			
JK1, 2	SJJG100A	Headphones	2
WIRE			
W1	SWEG690A	[EZ][M][MC][XL][XM] only	
RESISTORS			
R1～4 ⚠	ERG1ANJP680S	68Ω, 1W, Flame-Proof	4
CAPACITORS			
C1, 2	ECCR1H331J	330pF	2
C3	ECRR1H104ZF	0.1µF	1

ACP AC POWER SUPPLY CIRCUIT

Ref. No.	Part No.	Description	Per/Set
LINE FILTER			
L1 ⚠	SLTGLF3	Line Filter	1
JACK			
JK1 [XL] [XR] ⚠	SJSD16	AC IN	1
JK1 ⚠	SJS9236	AC IN, Other areas	1

Ref. No.	Part No.	Description	Per/Set
SWITCH			
S1 ⚠	SSRG100A	Voltage Selector	1
FUSES			
F1 M MC ⚠	XBA1C63NU100	6.3A, 125V	1
AM			
F2 EH ⚠	XBA2C20TB0	T2A, 250V	1
F1 ⚠	XBA2C40TB0	T4A, 250V Other areas	1
F2, 3 ⚠	XBA2C20TB0	T2A, 250V	2
CAPACITORS			
C1 ⚠	ECKCVA1472MF	4700pF, Line-Capacitor	1
C2 ⚠	ECQU2A104MN	0.1μF, 250V, Across-the Line Capacitor	1

AS AMP & POWER SUPPLY CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGS4172M2M	Power Amplifier	1
IC2	SVIGM5291P	Switching Regulator	1
IC3	SVIGM5F7815	+15V Voltage Regulator	1
IC4	SVIGM5F7915	−15V Voltage Regulator	1
TRANSISTORS			
S Q1, 2	2SC2320LFG	2SC1310FG (SUB. Part)	2
Q3	2SA1643		1
DIODES			
D1, 2 ⚠	SVDGERA1502Y	Rectifier	2
S D3~10 ⚠	SVDGS3V20-15	Rectifier	8
D11	SVDGRK14S	Diode	1
D12	MA2062LF	Zener, 6.2V	1
D13	MA165TA5		1
COIL			
L2	SLCG2A121TZ	Coil	1
WIRE			
W1	SWEG630A	[EZ][M][MC][XL][XM] only	1
RESISTORS			
R1~3	ERDS2TJ103	10KΩ	3
R4	ERDS2TJ472	4.7KΩ	1
R5	ERDS2TJ221	220Ω	1
R6, 7	ERDS2TJ223	22KΩ	2
R8	ERDS2TJ473	47KΩ	1
R9	ERDS2TJ472	4.7KΩ	1
R10 ⚠	ERQ14AJ2R0P	2Ω, 1/4W, Fuse Type	1
R11 ⚠	ERX1ANJPR22S	0.22Ω, 1W, Flame-Proof	1
R12	ERDS2TJ470	47Ω	1
R13 ⚠	ERG1ANJP221S	220Ω, 1W, Flame-Proof	1
R14	ER0S2TKF3571	3.57KΩ, ±1%	1
R15	ER0S2TKF1001	1KΩ, ±1%	1
R16 ⚠	ERD2FCG101	100Ω, 1/4W, Fuse Type	1
R17, 18	ERDS2TJ153	15KΩ	2
R19	ERDS2TJ681	680Ω	1
R20	ERDS2TJ473	47KΩ	1
R21	ERDS2TJ222	2.2KΩ	1
R22, 23	ERDS2TJ152	1.5KΩ	2
R24 ⚠	ERD25FVJ4R7	4.7Ω, 1/4W, Flame-Proof	1
R25, 26	ERDS2TJ153	15KΩ	2
R27	ERDS2TJ681	680Ω	1
R28	ERDS2TJ473	47KΩ	1
R29, 30	ERDS2TJ152	1.5KΩ	2
R31	ERDS2TJ222	2.2KΩ	1
R32~34	ERDS2TJ102	1KΩ	3
R35	ERDS2TJ104	100KΩ	1
R36 ⚠	ERD25FVJ4R7	4.7Ω, 1/4W, Flame-Proof	1
R37, 38	ERDS2TJ333	33KΩ	2
R39	ERDS2TJ682	6.8KΩ	1
R41	ERDS2TJ221	220Ω	1
CAPACITORS			
C3	ECEA1VU222	2200μF, 35V	1
C4	ECEA1VU332	3300μF, 35V	1
C5	ECEA1VU222	2200μF, 35V	1
C6	ECEA1VU332	3300μF, 35V	1
C7	ECEA0JKA470	47μF, 6.3V	1
C8	ECEA1HKA010	1μF, 50V	1
C9	ECEA1VKG100	10μF, 35V	1
C10	ECCR1H101J	100pF	1
C11	ECEA0JU102	1000μF, 6.3V	1
C12	ECKR1E473ZV	0.047μF	1
C13	ECQV1H474JZ	0.47μF	1
C14	ECCR1H101J	100pF	1
C15	ECEA1EKA4R7	4.7μF, 25V	1
C16	ECEA1EKA470	47μF, 25V	1
C17	ECRR1H104ZF	0.1μF	1
C18	ECQV1H474JZ	0.47μF	1
C19	ECCR1H101J	100pF	1
C20	ECEA1EKA4R7	4.7μF, 25V	1
C21	ECEA1EKA470	47μF, 25V	1
C22	ECEA1VKG100	10μF, 35V	1
C23	ECRR1H104ZF	0.1μF	1
C24, 25	ECQB1H223JZ	0.022μF	2
C28	ECEA1HU330	33μF, 50V	1
C30, 31	ECEA1VKG100	10μF, 35V	2
C33	ECEA50Y22	22μF, 50V	1
C34, 35	ECEA50Y3R3	3.3μF, 50V	2
C36	ECEA50Y22	22μF, 50V	1
C37 ⚠	ECQE1A104M6	0.1μF, 125V, [EZ][M][MC][XL][XM] only	1

PC PEAK CANCELLER CIRCUIT

Ref. No.	Part No.	Description	Per/Set
COIL			
L1	SLCSC331KU	330μH	1
RESISTOR			
○ R1 ⚠	ERF5ZXJ560	56Ω, 5W, Flame-Proof	1

Ref. No.	Part No.	Description	Per/Set
CAPACITOR			
C1	ECEA50Y6R8	6.8µF, 50V	1

DRV DIGITAL REVERB CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	MN1280R	Reset IC	1
IC2	SVIGHM65256	256K bit Pseudo Static RAM	1
IC3	SVIGMB622416	Gate Array	1
IC4	MN8305S	A-D/D-A Converter	1
IC5	SVIG87064075	Digital Signal Processor	1
IC6	SVIGM5278L05	+5V Voltage Regulator	1
IC7	SVIGM5220L	Operational Amplifier	1
IC8~10	SVIGM5218L	Operational Amplifier	3
IC11	SVIGLM1894N	Dynamic Noise Reduction	1
IC12	MN74HC02S	Quad 2-Input NOR Gates	1
TRANSISTORS			
Q1, 2	2SJ105GR	FET	2
DIODES			
D1~5	MA165TA5		5
D6	EK04		1
OSCILLATOR			
X1	SVQGA20MX040	20MHz, Ceramic Oscillator	1
COMPONENT COMBINATION			
ZC1	EXFP8101MW	100pF×8	1
COIL			
L1	SLQG15W34DPQ	Coil	1
SEMI-FIXED RESISTOR			
VR1	EVND4AA00B14	10KΩ B, DRV Bias	1
RESISTORS			
R1	ERDS2TJ333	33KΩ	1
R2	ERDS2TJ682	6.8KΩ	1
R3, 4	ERDS2TJ473	47KΩ	2
R5	ERDS2TJ393	39KΩ	1
R6, 7	ERDS2TJ103	10KΩ	2
R8	ERDS2TJ473	47KΩ	1
R9	ERDS2TJ152	1.5KΩ	1
R10	ERDS2TJ563	56KΩ	1
R11	ERDS2TJ183	18KΩ	1
R12, 13	ERDS2TJ823	82KΩ	2
R14	ERDS2TJ153	15KΩ	1

Ref. No.	Part No.	Description	Per/Set
R15	ERDS2TJ103	10KΩ	1
R16	ERDS2TJ472	4.7KΩ	1
R17	ERDS2TJ153	15KΩ	1
R18	ERDS2TJ103	10KΩ	1
R19	ERDS2TJ472	4.7KΩ	1
R20	ERDS2TJ682	6.8KΩ	1
R21~23	ERDS2TJ473	47KΩ	3
R24	ERDS2TJ682	6.8KΩ	1
R25~27	ERDS2TJ473	47KΩ	3
R36, 37	ERDS2TJ331	330Ω	2
R38	ERDS2TJ102	1KΩ	1
R39	ERDS2TJ221	220Ω	1
R40, 41	ERDS2TJ473	47KΩ	2
R44, 45	ERDS2TJ472	4.7KΩ	2
R46, 47	ERDS2TJ221	220Ω	2
R50~52 ⚠	ERD2FCJ4R7	4.7Ω, 1/4W, Fuse Type	3
R53, 54 ⚠	ERD2FCG100	10Ω, 1/4W, Fuse Type	2
R55	ERDS2TJ105	1MΩ	1
R58, 59	ERDS2TJ101	100Ω	2
R62~66	ERDS2TJ152	1.5KΩ	5
R68~70	ERDS2TJ472	4.7KΩ	3
R71	ERDS2TJ225	2.2MΩ	1
R72	ERDS2TJ332	3.3KΩ	1
R73, 74	ERDS2TJ225	2.2MΩ	2
R75	ERDS2TJ682	6.8KΩ	1
R76	ERDS2TJ332	3.3KΩ	1
CAPACITORS			
C1	ECQB1H153JZ	0.015µF	1
C2	ECQG1H682KZ	0.0068µF	1
C3, 4	ECCR1H471J	470pF	2
C5	ECCR1H101J	100pF	1
C6	ECEA1HKA010	1µF, 50V	1
C8	ECEA1HKA010	1µF, 50V	1
C9	ECQG1H152KZ	0.0015µF	1
C10	ECCR1H151J	150pF	1
C11	ECEA1HKA010	1µF, 50V	1
C12, 13	ECQG1H472KZ	0.0047µF	2
C14, 15	ECCR1H471J	470pF	2
C16	ECCR1H101J	100pF	1
C17	ECEA1HKA010	1µF, 50V	1
C18, 19	ECQG1H472KZ	0.0047µF	2
C20, 21	ECCR1H471J	470pF	2
C22	ECCR1H101J	100pF	1
C31, 32	ECEA1HKA010	1µF, 50V	2
C33	ECEA1HKAR22	0.22µF, 50V	1
C34	ECQB1H103JZ	0.01µF	1
C35	ECEA1HKAR22	0.22µF, 50V	1
C36	ECQB1H103JZ	0.01µF	1
C37	ECQV1H473JZ	0.047µF	1
C38	ECQV1H104JZ	0.1µF	1
C39	ECQB1H103JZ	0.01µF	1
C40	ECQG1H332KZ	0.0033µF	1
C41	ECEA1CKA470	47µF, 16V	1
C42	ECEA1CKA100	10µF, 16V	1
C43	ECEA1CKA470	47µF, 16V	1
C50~52	ECEA0JKA101	100µF, 6.3V	3
C53	ECEA0JU102	1000µF, 6.3V	1
C54	ECEA0JU331	330µF, 6.3V	1
C55, 56	ECEA1CKA101	100µF, 16V	2
C57	ECCR1H101J	100pF	1
C58, 59	ECCR1H100D	10pF	2
C60	ECKR1E473ZV	0.047µF	1
C62, 63	ECKR1E473ZV	0.047µF	2
C65, 66	ECCR1H470J	47pF	2
C67	ECRR1H104ZF	0.1µF	1

Ref. No.	Part No.	Description	Per/Set
C68	ECEA1HKN010	1μF, 50V	1
C69	ECEA1HKA010	1μF, 50V	1
C70, 71	ECCR1H101J	100pF	2
C72	ECKR1E473ZV	0.047μF	1
C73	ECRR1H104ZF	0.1μF	1
C100	ECRR1H104ZF	0.1μF	1

CPR CONTROL PANEL RIGHT CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGM603A121	Gate Array	1
IC2~5	SVIGM74LS07	Hex Buffers (O.C.)	4
TRANSISTORS			
Q1~4	2SA830SB		4
DIODES			
D1~43, 45, 47~49	MA165TA5		47
D50~77, 84, 87, 89~94, 96~102, 105	LN282R	LED (Red)	44
D78~83, 85, 86, 88, 104	LN382G	LED (Green)	10
DISPLAY			
LD1	LB603VF	Triple 8 Segments Display	1
SWITCHES			
S1~43, 45, 47, 48	SSHG1046A	Push switch	46
IC PROTECTOR			
○ IP1	ICP-N10T104		1
RESISTORS			
R1	ERDS2TJ102	1KΩ	1
R2	ERDS2TJ184	180KΩ	1
R3	ERDS2TJ221	220Ω	1
R4	ERDS2TJ103	10KΩ	1
R5	ERDS2TJ152	1.5KΩ	1
R6~17	ERDS2TJ103	10KΩ	12
R18~39	ERDS2TJ470	47Ω	22
CAPACITORS			
C1	ECEA0JKA101	100μF, 6.3V	1
C2	ECRR1H104ZF	0.1μF	1
C3, 4	ECCR1H101J	100pF	2
C5	ECEA1HKA010	1μF, 50V	1
C6~8	ECRR1H104ZF	0.1μF	3

FDCN FD CONNECTOR CIRCUIT

Ref. No.	Part No.	Description	Per/Set
COMPONENT COMBINATIONS			
ZC1, 2	EXFP8470MW	47pF×8	2
COILS			
L1	SLQG15W33AP	Coil	1
L2, 3	SLQG10W10D1P	Coil	2
WIRE			
W1	SWEG640A		1
CAPACITOR			
C1	ECRR1H104ZF	0.1μF	1

CPL CONTROL PANEL LEFT CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGM603A121	Gate Array	1
IC2, 3	SVIGM74LS07	Hex Buffers (O.C.)	2
TRANSISTORS			
Q1~4	2SA830SB		4
DIODES			
D1~45	MA165TA5		45
D46~77	LN282R	LED (Red)	32
SWITCHES			
S1~24	SSHG1046A	Push switch	24
S25~29	SSSG1011A	Balance	5
IC PROTECTOR			
○ IP1	ICP-N10T104		1
VARIABLE RESISTOR			
VR1	EVD06510B24G	20KΩ B, Main Volume	1
RESISTORS			
R1	ERDS2TJ102	1KΩ	1
R2	ERDS2TJ184	180KΩ	1
R3	ERDS2TJ221	220Ω	1
R4	ERDS2TJ103	10KΩ	1
R5	ERDS2TJ152	1.5KΩ	1
R6~17	ERDS2TJ103	10KΩ	12
R18~28	ERDS2TJ470	47Ω	11
CAPACITORS			
C1	ECEA0JKA101	100μF, 6.3V	1
C2	ECRR1H104ZF	0.1μF	1
C3, 4	ECCR1H101J	100pF	2
C5	ECEA1HKA010	1μF, 50V	1
C6~8	ECRR1H104ZF	0.1μF	3

CPSQ SEQUENCER CONTROL CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1, 2	SVIGM74LS07	Hex Buffers (O.C.)	2
DIODES			
D1, 2, 13~25, 29~33	LN282R	LED (Red)	20
D3~12, 26, 28, 34~36	LN382G	LED (Green)	15
D37~50, 52~56	MA165TA5		19
SWITCHES			
S37~50, 52~56	SSHG1049A	Push Switch	19
RESISTORS			
R1~9	ERDS2TJ470	47Ω	9
CAPACITOR			
C1	ECRR1H104ZF	0.1μF	1

MKB1 MANUAL KEYBOARD 1 CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	MN50020PGV	Gate Array	1
IC2	MN1231	1K bit Programmable ROM	1
DIODES			
S D1~88	MA162A	MA150IR (SUB. Part)	88
OSCILLATOR			
X1	EF0FC4004A3	4MHz, Ceramic Oscillator	1
RESISTORS			
R1	ERDS2TJ101	100Ω	1
R2	ERDS2TJ103	10KΩ	1
R3	ERDS2TJ222	2.2KΩ	1
R4	ERDS2TJ472	4.7KΩ	1
CAPACITORS			
C1	ECCR1H681J	680pF	1
C2	ECRR1H104ZF	0.1μF	1
C3	ECCR1H681J	680pF	1
C4	ECEA0JKA470	47μF, 6.3V	1
C5	ECRR1H104ZF	0.1μF	1

MKB2 MANUAL KEYBOARD 2 CIRCUIT

Ref. No.	Part No.	Description	Per/Set
DIODES			
S D89~176	MA162A	MA150IR (SUB. Part)	88
COMPONENT COMBINATION			
Z1	EXBPI8472JM	4.7KΩ×8	1

■ WIRING PARTS

Ref. No.	Part No.	Description	Per/Set
○ W1	QEXG06011ZA	Connector with Wire	1
W2	QEXG03017ZA	Connector with Wire	1
W3	SWKG0874SSA	Connector with Wire	1
○ W4	QEXG03027ZA	Connector with Wire	1
○ W5	QEXG09010ZA	Connector with Wire	1
○ W6	QEXG07003SSA	Connector with Wire	1
○ W7	QEXG10006SSA	Connector with Wire	1
W8	SWKG04103SSB	Connector with Wire	1
○ W9	QEXG15008SSA	Connector with Wire	1
W10	QEXG13005SSA	Connector with Wire	1
W11	SWKG1516SSA	Connector with Wire	1
○ W12	QEXG03026LTA	Connector with Wire	1
○ W13	QEXG16008SSA	Connector with Wire	1
○ W14	QEXG11007SSA	Connector with Wire	1
○ W15	QEXG13001SSA	Connector with Wire	1
W16	SWKG151SSA	Connector with Wire	1
○ W17	QEXG06012ZA	Connector with Wire	1
○ W18	QEXG05019STA	Connector with Wire	1

REPLACEMENT PARTS LIST.....Cabinet and Chassis Parts

Notes:

1. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
2. ○ mark are new parts.
3. For part No. with area mark, check the area when placing an order.

■ CABINET & CHASSIS PARTS

Ref. No.	Part No.	Description	Per/Set
SWITCH			
S1 ⚠	SSHG1050A	Power Switch	1
SPEAKERS			
SP1, 2	EAS15S09A	13cm×6cm, 8Ω	2
SP3, 4	SASG16PL03-F	16cm, 8Ω	2
SP5, 6	EAS65PH31A	6.5cm, 8Ω	2
TRANSFORMERS			
T1 M XM MC ⚠	SLTG5N43	Power Transformer	1
T1 Others ⚠	SLTG5N38	Power Transformer	1
POWER CORD & PLUG			
PC1 EK XS XD ⚠	SJAG39	AC Power Cord	1
PC1 EH ⚠	SJAG41	AC Power Cord	1
PC1 XL XR ⚠	SJAG61	AC Power Cord	1
PC1 M XM MC ⚠	SJAG62	AC Power Cord	1
PC1 Others ⚠	SJAG65	AC Power Cord	1
PC2 X ⚠	SJP5213-1	Attachment Plug, [X] only	1
PC3 XD ⚠	SJPG1350A	Power Plug, [XD] only	1
DIODE			
D1	LN29RP	Power Indicator (LED)	1
CABINET PARTS			
○ 1	QGAG1008AA	Music Rack	1
2	SBLG51A	Stay	2
○ 3	QKQGA027AA	Top Cover	1
○ 4	QKQGF004BA	Keyboard Cover Ass'y	1
○ 4-1	QMQG0001IA	Axletree	1
○ 4-2	QMRG7014AA	Gear	2
4-3	STPG7021A	Bearing	3
4-4	QMFG1029AA	Felt	2
4-5	SHSG4570A	Felt	2
○ 4-6	QMFG4039AA	Felt	2
4-7	SHSG5240A	Felt	1
4-8	SHGG1052A	Cushion	2
○ 5	QGPG0014AC	Control Panel	1
○ 6	QMFG4028AA	Net	1
○ 7	QMFG4029AA	Net	1
○ 8	QMFG4030AA	Net	1
9	SHSG3430A	Felt	1
○ 10	QGPG0015AB	Subpanel Frame	1
○ 11	QGPG0016AF	Subpanel	1
○ 12	QGPG0017AA	Subpanel Cover	1
○ 13	QGUG1076AA01	Button Ass'y	1
○ 14	RDG5782ZB	Gear	1
○ 15	RMS0123	Pin	3
○ 16	QMRG7013AA	Roller	3
○ 17	QMRG7012AA	Roller	2
○ 18	QMFG4033AA	Felt	1

Ref. No.	Part No.	Description	Per/Set
19	QMFG1026AA	Felt	1
○ 20	QMFG4032AA	Felt	3
○ 21	QGPG0018AB	Cover	1
○ 22	QMAG0008BA	Bracket	1
○ 23	QMFG4035AA	Felt	1
○ 24	QGPG0019AA	LED Panel	1
25	QGUG1040AA	Button, Power Switch	1
○ 26	QGUG1059AA	Button	1
○ 27	QGUG1060AA	Button	2
○ 28	QGUG1061AA	Button	1
○ 29	QGUG1062AA	Button	1
○ 30	QGUG1063AA01	Button	1
○ 31	QGUG1064AA	Button	1
○ 32	QGUG1065AA	Button	1
○ 33	QGUG1066AA	Button	1
○ 34	QGUG1067AA01	Button	1
○ 35	QGUG1068AA01	Button	1
○ 36	QGUG1069AA01	Button	1
○ 37	QGUG1070AA	Button	1
○ 38	QGUG1071AA	Button	1
○ 39	QGUG1072AA01	Button	1
○ 40	QGUG1073AA	Button	3
○ 41	QGUG1074AA	Button	1
○ 42	QGUG1075AA	Button	1
43	SBNG7050A	Knob	6
44	SGEG260A	Ornament	6
○ 45	QMGG010AA	Spacer	5
○ 46	QKQGD016AA	Rear Board	1
○ 47 M XM MC EH	QGKG0019HB	Jack Panel	1
○ 47 Others	QGKG0019GB	Jack Panel	1
○ 48	SHRG9921A	Spacer	1
49	SGBG160B	Badge	1
50	SHRGA7280A	Cushion	2
51	SGWG2210B	End Cover Panel	2
52	SHSG3690A	Felt	2
53	QLZG001A	Core M XM MC	3
54	SHRG1270A	Mounting Base XL EE	3
○ 55	QQLG021BA	MIDI Seal	1
56			
STAND			
○ 57	QKUG1008AA	Rear Board	1
○ 58	QEXG06011ZA	Connector with Wire	1
○ 59	QYKG046AA	Speaker Box	1
○ 60	QKQGB100AA	Left Plank Ass'y	1
60-1	SHRG2130B	Foot	2
○ 61	QKQGB101AA	Right Plank Ass'y	1
61-1	SHRG2130B	Foot	2
○ 62	QKQGM007AA	Pedal Box Ass'y	1
63	QMFG1039AA	Felt	3
○ 64	QJLG003AA	Pedal Cord	1
65	SHRG1230A	Cord Clamper	2
66	SHRG9620A	Cord Clamper	5
67	SRDSMLS-2	Switch	3
68	QMWG8005AB	Switch Cover	3

Ref. No.	Part No.	Description	Per/Set
69	STBG3115A	Pedal Arm	3
70	SUSG441A	Spring	3
71	SKLG160A	Foot	1
72	SHSG2750A	Felt	3
73	SHSG2770A	Felt	3
74	SHSG2790A	Felt	3
75	SUWG219	Binder	2
76	SHRG1130A	Cord Clamper	1
MANUAL KEYBOARD			
77	STBGA1050A	White Key (First Octave A Key)	1
78	STBGA1060A	White Key (B Key)	8
79	STBGA1070A	White Key (C Key)	7
80	STBGA1080A	White Key (D Key)	7
81	STBGA1090A	White Key (E Key)	7
82	STBGA1100A	White Key (F Key)	7
83	STBGA1110A	White Key (G Key)	7
84	STBGA1120A	White Key (A Key)	7
85	STBGA1130A	White Key (Top Octave C Key)	1
86	STBG2920A	Black Key	36
87	SUSG531A	Spring	88
88	QMWG9006AA	Hammer (Black Key)	36
89	QMWG9005AA	Hammer (White Key)	52
90	SHGG9121A	Rubber Cap (Hammer)	88
91	SHRG9900B	Key Guide Rubber	88
92	SHSG5910A	Felt	52
93	QMFG4021AA	Felt	2
94	QMWG8004AB	Fulcrum (4 pcs. on one)	1
95	QMWG8003AB	Fulcrum (12 pcs. on one)	7
96	QMFG1036AA	Felt	3
97	SHRGA9080A	Sponge	2
98	QMFG1046AA	Felt	2
99	SHSG3461A	Felt	1
100	QMFG1049AA	Felt	2
101	SHSG2670A	Felt	1
102	SHSG3552A	Felt	2
103	SHSG3451A	Felt	2
104	SHRG7301A	Sponge	1
105	QMWG6001AA	Actuater	11
106	QMWG6003AA	Membrane Sheet	2
107	QMWG6002AA	Membrane Sheet	4
108	SHRG9751A	P.C.B. Holder	24
SCREWS & WASHERS			
N1	XTB35+12AFVC	Screw	2
N2	XSC3+12FVCS	Screw	2
N3	XTB35+10AFVC	Screw	4
N4	XTN3+6F	Screw	2
N5	XTV3+10C	Screw	1
N6	XTV3+6C	Screw	4
N7	XTV3+12GFZ	Screw	3
N8	XTW3+10JFZ	Screw	2
N9	XTW3+10Q	Screw	3
N10	XTW3+8T	Screw	27
N11	XTB3+12G	Screw	10
N12	XYN3+F6FZ	Screw with Washer	2
N13	XTT4+25AFVC	Screw	14
N14	XYN4+F30FZ	Screw with Washer	4
N15	XTB3+10B	Screw	12
N16	XTB35+12A	Screw	33
N17	XTB3+14GFVC	Screw	2
N18	XTW3+6LFVC	Screw	2

Ref. No.	Part No.	Description	Per/Set
N19	XTS3+6B	Screw	2
N20	XYN5+F20	Screw with Washer	3
N21	XTW3+10JFVC	Screw	3
N22	XTB3+10A	Screw M XM MC	3
N23	SNEG2660A	Screw EZ XL	4
N24	SNEG150A	Washer	2
N25	XWG5J12	Washer	2
N26	XWA5B	Washer	2
○ N27	QHDG012AA	Screw	2
○ N28	QHDG007AA	Screw with Washer	5
N29	XYN4+F65	Screw with Washer	1
N30	SNEG1770A	Retaining Ring	1
N31	SNEG1780A	Retaining Ring	1
○ N32	QHDG009AA	Screw Bolt (Brown)	8
N33	SNE499-1	Nut	8
N34	XTT4+12A	Screw	8
N35	QHDG004AA	Screw	2
N36	SNEG2280A	Screw Bolt (Black)	4
N37	XTB35+14A	Screw	4
N38	XYN4+F16FZ	Screw with Washer	3
N39	XTW3+16JFZ	Screw	8
N40	XTB3+6C	Screw	1
N41	XTW3+8C	Screw	12
N42	XYN4+C25	Screw with Washer	1
N43	XTB4+12A	Screw	7
N44	XYN5+C6FZ	Screw with Washer	1
N45	XTW3+10T	Screw	25
N46	XSN4+8	Screw	3